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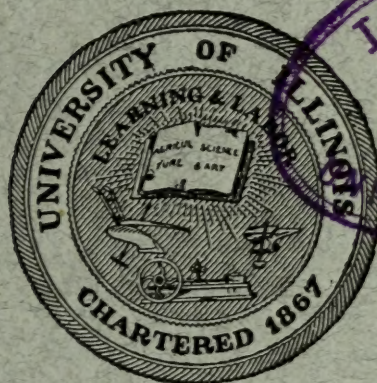
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THE VOLUTE IN ARCHITECTURE  
AND  
ARCHITECTURAL DECORATION

BY  
REXFORD NEWCOMB

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UNIVERSITY OF ILLINOIS  
ENGINEERING EXPERIMENT STATION

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MARCH, 1921

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THE VOLUTE IN ARCHITECTURE AND  
ARCHITECTURAL DECORATION

BY

REXFORD NEWCOMB

ASSISTANT PROFESSOR OF ARCHITECTURAL HISTORY

ENGINEERING EXPERIMENT STATION

PUBLISHED BY THE UNIVERSITY OF ILLINOIS, URBANA



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# THE VOLUTE IN ARCHITECTURE AND ARCHITECTURAL DECORATION

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## I. INTRODUCTION

1. *Purpose of the Study.*—Concerning the use of the volute in connection with the Ionic order much has been written. Varied and fanciful theories have been advanced to explain or prove its origin. But scarcely anything has been recorded as to the wide use of the volute in other structural and decorative architectural forms, or the lessons to be drawn from this use. As a matter of fact the volute is one of the most universally occurring of all art motifs, its early use as decoration antedating by many centuries its incorporation into the Ionic capital. It was with a view to pointing out the universality of the use of the volute and the bearing that this fact has upon the development of the Ionic order, that the present study was undertaken.

It is hoped, furthermore, that it will be possible to prove that the volute, as an art-form, is the natural outcome and the logical result of man's environment; that the volute is inseparably linked with nature, being one of the few configurations convenient to living cellular forms; that with the appreciation, by man, of this principle in nature, it becomes a part of his natural experience, a thing to be felt, as its rhythm or color; and that it would seem childish, therefore, to explain the introduction of the volute into the Ionic order as the result of man's imitation of the curve of any particular natural form, such as that of the sea shell, or the ram's horn, or to attempt to account for that introduction by the fact that certain spiral forms were extant in this country or that at a given time. It is intended to show that spiral forms are to be found in all countries at all times under one guise or another; that the volute has a much deeper and more fundamental meaning than any of those that have been claimed for it in the past; that it is a principle in nature, a very potent and fundamental law of growth, appreciable in all forms from the lowest to the highest; that what man experiences so universally in nature and feels so fundamentally, he is pretty likely to incorporate into his artistic expression; or, in other words, that the volute had become,

in very early times, an abstract, though dynamic, principle in thought and life, and, in art, "an element of beauty," appreciated by the mind of man,—that appreciation predicated, to be sure, upon biological and geological pre-conditions—"an element," akin to unity, rhythm, balance, and the various geometrical progressions in nature that have found their way into art.

It is the purpose of this study to develop this method of approach in order to explain the extremely wide and varied use of the volute in architecture, and ultimately to present what is apparently the natural and logical reason, as well as the valid argument, for the existence of the volute in an order of architecture.



## II. THE VOLUTE

2. *Definition.*—The volute or spiral is defined in mathematics as any plane curve formed by a point that moves around a fixed center continually increasing its distance from it, or again, as the locus of the extremity of a line (or radius vector) which varies in length as it revolves about a fixed point or origin. These are general definitions and do not adequately describe the regular spiral, which is known as the “Spiral of Archimedes,” and defined as a curve formed by a point moving with uniform angular velocity and receding from the center at a uniform rate.\*

This last definition more nearly describes the spiral that is most frequently encountered in art. It is not, however, the spiral of nature. In other words, the spiral of art and architecture is not the spiral of nature, any more than any other art-motif is identical with the thing in nature that inspired it.† but is the spiral of nature, idealized and conventionalized into something more nearly approaching the abstract or ideal. That is, after all, the artistic process: art, if it is anything, is nature plus man’s idealism. So then the volute in architecture occupies a place analogous to that of the Venus de Milo in sculpture. The Venus de Milo represents not what any Greek woman ever was, but what every Greek woman would like to have been—that is, the Greek woman idealized. Similarly the volute is not the spiral of the ram’s horn, of the nautilus, of the snail-shell, nor of wave motion; it is all of these, or the spirit common to all, idealized and conventionalized from the natural originals.

It must be borne in mind that the great majority of art-motifs owe their birth to attempted realism. Forms are meant first to be lifelike, or at least, to suggest real objects. Conventionalization follows realism.‡ But even primitive man was not content merely to represent

---

\* T. L. Heath, in the “Works of Archimedes,” defines the spiral thus: “If a straight line drawn in a plane revolve at a uniform rate about one extremity which remains fixed and return to the position from which it started, and if, at the same time as the line revolves, a point move at a uniform rate along the straight line beginning from the extremity that remains fixed, the point will describe a spiral in the plane.”

† Ruskin, in “Modern Painters,” Vol. IV, Chap. XVII, discusses the mathematical development of the spiral of nature. Its development is illustrated by Fig. 1.

‡ Haddon, “Evolution in Art,” p. 7.

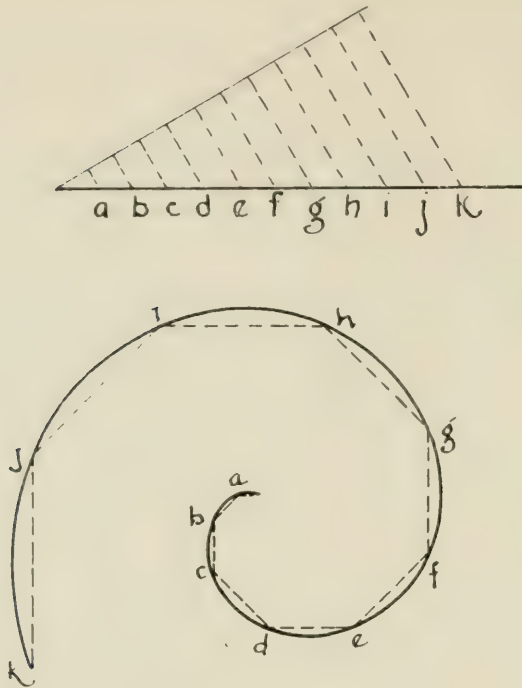


FIG. 1. THE SPIRAL OF NATURE, AFTER RUSKIN

realistically the various spiral forms. The earliest spirals found, although they are used in connection with animal or plant-forms, are conventional in treatment rather than naturalistic.

3. *Attributes of the Volute.*—In this connection it will be interesting and instructive to attempt to interpret something of the spirit or feeling of the volute. The characteristics of the volute are, perhaps, two fold. It is particularly unified in that it is related to a definite point or center, yet it is universal and all-embracing in that it is ever-widening as it recedes from that center in its generation, and infinite in its conception. Moreover, the volute is capable of two interpretations depending upon the way the mind follows the curve. It may mean from a very particular definite point out into the everywhere, or it may mean just the reverse—from infinity into the finite particular center. Thus it can be employed as a terminating motif in art, serving equally well as a beginning or as an ending.

This terminating characteristic is appreciated in nature. In certain of the animal-forms the center is the beginning, the process of growth taking place from this center outward; this is true of the spiral shell-forms such as the chambered nautilus, snails, and other



forms. In others, the process is reversed, as in the ram's horn, which grows out and curls up as it grows. This latter method of growth is also found in the case of most plant tendrils. On the other hand an unfolding fern-frond obeys neither progression; it comes through the surface of the ground fully voluted and then unrolls. Abstractly, however, we generally conceive the volute as progressing from the center outward in an ever-widening sweep.

In addition, the volute always inspires one with its dynamic character. It is one of the most engrossing and interesting curves in nature or art, and though not so difficult to trace as some decorative interlacings, it is, nevertheless, a rather involved curve for the human eye. The involved form, and the suggestion of the infinite, are enough to generate a mysterious interest and, perhaps for this reason among others, the curve has been widely used in art. Ruskin\* has remarked "the inherent power of all representations of infinity over the human heart." The volute, however is scarcely as beautiful as some of the subtle "S" curves found in nature and perpetuated in art.

4. *Origin of the Volute.*—The introduction of the spiral or volute into art and its travel from the place of its early conception as an art-motif to the various early cultural centers have been the subjects of many discussions. So wide is the geographical distribution of the spiral in art, savage and civilized, that it would seem that it originally must have been introduced at many widely separated and geographically unrelated points.† May not its use have sprung up spontaneously in many cultural centers?‡

Just what was the source of the spiral motif is not so plain. Two theories concerning this have a place in any discussion; these are the theories that (a) derive the spiral from nature: or, (b) attribute to it a technomorphic origin.

Concerning the first theory much may be said. Nature has been very prodigal in her use of spirals and spirally inclined curves. The spiral is found throughout the earth in one form of life or another,

\* Ruskin, "Modern Painters," Vol. II, p. 99.

† See Breasted, "A History of the Ancient Egyptians," p. 253. Bell, "Architecture of Ancient Egypt," p. 76. Hamlin, "History of Ornament," p. 46. Evans, "Scripta Minoa," p. 126. Hall, H. R., "Decorative Art of Crete in the Bronze Age," p. 9. Baikie, "Sea-Kings of Crete," pp. 48, 193, etc.

‡ Taylor, "The Origins of the Aryans," pp. 52, 132.

and of the universality of this curve we have ample proof, not only in these spirals of terrestrial origin, but also in the spiral nebulae found in the heavens about us.\* In plant life, the spiral is a frequently recurring form, appearing in fern-fronds, tendrils, and

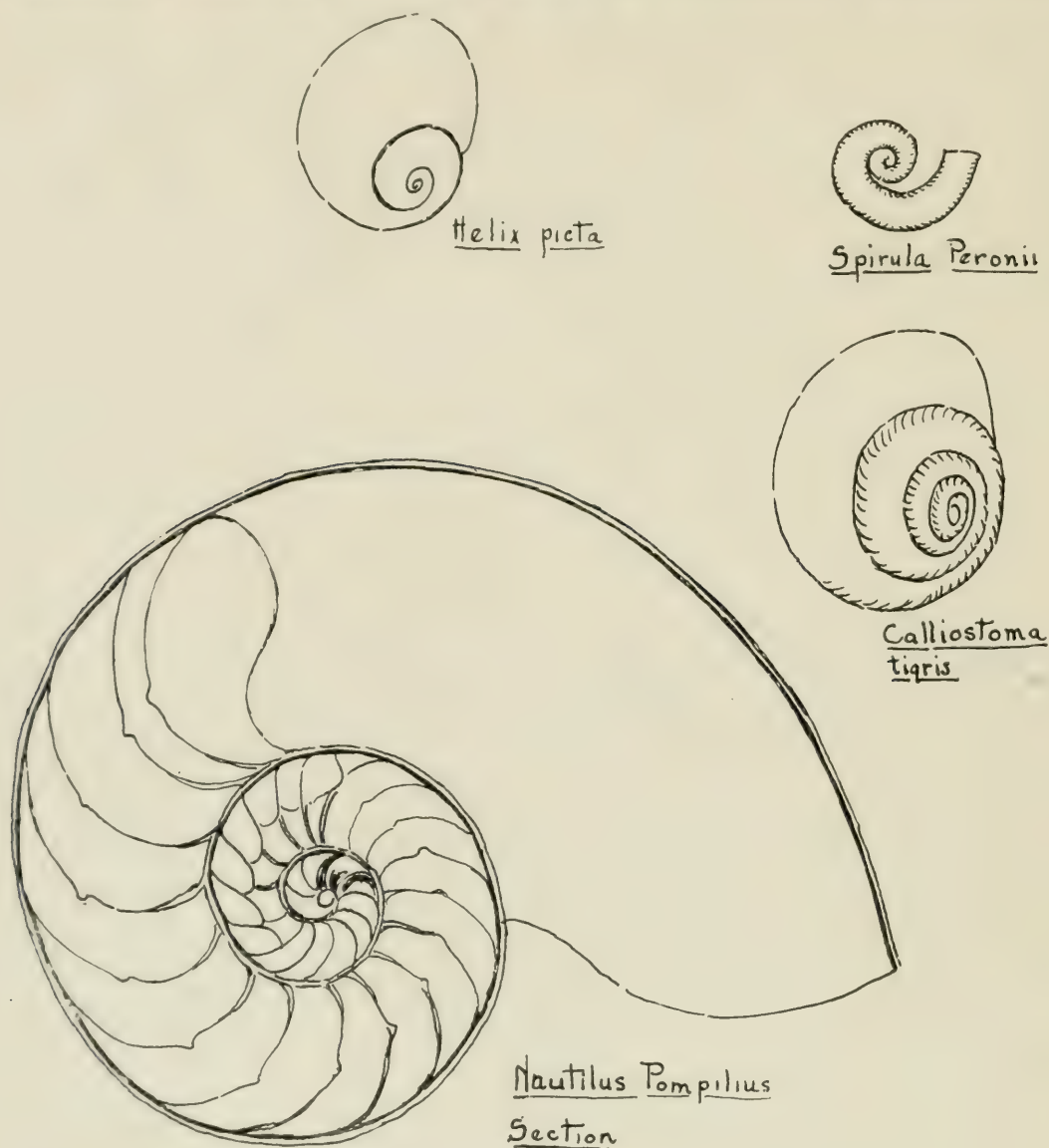


FIG. 2. SHELL SPIRALS, FROM NATURE

leaf curvatures. The vegetable origin of many volutes in art is betrayed by their use with vegetable or floral forms, and indeed this affinity is so marked that it has been the basis for an argument deriving all spiral or voluted forms from the Egyptian lotus.† In animal

\* Herbert, "First Principles of Evolution," p. 15.

† Goodyear, "Grammar of the Lotus."



life, the spiral is, if anything, of more frequent occurrence than in plant life, being found in such forms as the chambered nautilus, various spirulæ, volutidæ, and numberless others (Fig. 2). It is characteristic of a whole family of land shell-bearing creatures, typified by our common snails. Moreover, it is a habitual bodily configuration of many animal forms such as worms and snakes, and is the curve found in the horns of certain sheep and goats, as well as being a characteristic termination of the antennæ of many insects. The origin of the spiral in art has also been attributed to a conventionalization of wind and water\* motion, and for this reason the curve is often called the "wave-motif."†

The idea of the technomorphic origin of the spiral has been well developed by Dr. Holmes‡ in connection with his attempt to account for this motif on much of the pottery of the American Indian. Basket building with the Indian consisted, in many cases, of "raising" the basket by a coiling of grass ropes previously prepared, and of stitching or securing each succeeding coil to the one below it. This same method, in the absence of a pottery wheel, was used in "raising" pottery forms,¶ such as bowls or vases, and has, no doubt, been practised in all lands. When the basket or bowl thus formed was ready for decoration, what motif would be more appropriate and natural than the spiral, the symbol typifying the spirit or principle of the construction?§

From the earliest times, as everyone knows, women have wound their hair into coils of more or less spiral form. This habit has been utilized by the Latin authority Vitruvius\*\* in his explanation of the Ionic volute. Moreover, the spiral or volute is arrived at, technomorphically, by the rolling up of skins, metal or paper.

Now it appears probable that in certain quarters of the globe the spiral may have had a technomorphic origin; but with the wide

\* Holmes and Cushing, *Annual Report of the Bureau of Ethnology*, Vol. IV., p. 460. 1886. "This same figure, in use by the Indians of the interior of the continent, is regarded as symbolic of the whirlwind, and it is probable that any symbolizing people will find in the features and phenomena of their environment, whatever it may be, sufficient resemblance to any of their decorative devices to lead to a symbolic association." See also p. 515.

† Hamlin, *Op. Cit.*, pp. 46, 97.

‡ Holmes, "Origin and Development of Form and Ornament in Ceramic Art," *Annual Report of the Bureau of Ethnology*, Vol. IV, 1886.

¶ Mason, "The Origins of Inventions," Chap. V.

§ Elliott, "Prehistoric Man and His Story," pp. 296-7.

\*\* Vitruvius, *Book IV*, Chap. I, ". . . in the capital they placed the volutes, hanging down at the right and left like curly ringlets."

distribution of spirals and spirally-inclined forms in all nature it seems likely that man must have appreciated the curve of the sea-shell, the spiral motion of the breaker upon the beach, or the spiral tendency of floral forms, long before he actually discovered the spiral in connection with his manipulation of materials. Indeed this very principle, appreciated in nature as a natural and logical method of construction since it is so prevalent in plant and animal structure, may have led to this method of basketry or vase-making.

The spiral then is a natural form, a form predicated upon natural structure. Curvature is a law of nature remarked by Ruskin,\* and will be found in one form or another in all and through all phases of nature. These curves in nature have in a measure determined man's mental habits. Thus the human mind finds curves more pleasant than right lines, and the curves that approach infinity the most interesting and pleasing of all. The spiral, because it is among the curves more nearly infinite in conception, has from very early times greatly appealed to the mind of man, and has for that reason entered very deeply into his artistic expression.

Whether or not it can be established that the spiral is conventionalized wave-motion, the representation of a sea-shell, or the curve of a ram's horn, is immaterial. It is possible that all of these concrete phenomena and many more have inspired early artists with a love of the spiral at one time or another, but it was the beautifully rhythmic curve—the law and spirit behind all these specific forms—that man loved, and still loves, not the particular natural form. Whether or not the spiral was technically given form originally through a technomorphic process is likewise immaterial. Nature with her wealth of beautiful spirals was all about primitive man as she is about man today, and nature shaped his mental processes long before he began to manipulate materials. It would seem reasonable therefore to conclude that this curve entered art like most other forms from nature-inspired beginnings.

So then, in the last analysis, it must appear that the spiral is typical or representative of a law of growth in nature, and stands for a more fundamental principle in life and art than the mere representation imitatively by man of any one particular form would indicate. Once into art, from whatever source, it became a popular and engrossing motif for reasons already pointed out. Its popularity

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\* Ruskin, "Modern Painters," Vol. II, p. 200; Vol. IV, p. 187.



has prevailed and will continue to prevail as long as the mind of man bears the same relation to nature as in the past and the present. In other words the volute continues in art because it is in nature.

Now, while the volute as a motif has continued perennially interesting and beloved, the application of the volute in art is a thing that has changed and will continue to change. It is with this changing use of the volute that we are now concerned.

### III. EARLY USE OF THE VOLUTE

5. *In the Arts.*—Early man by virtue of his mental limitations demanded that he see the actual line of the spiral curve. This demand led to the execution of the primitive spirals found in many parts of the world and dating back to the Bronze and even to the Stone Age.\* In this connection it is interesting to note that the earliest spirals found in art are entirely abstract and completely divorced from their inspiration in nature. In later times, however, there are found cases where the single spiral and even running spirals form the motif of much decoration but in which the line of the spiral is largely hidden and obliterated by other detail. Even paintings have been conceived upon the volute as a motif, the volute itself being implied in the finished work. A good example of this type is Burne-Jones' "Golden Stair" (Fig. 3).

The earliest spirals of historic ornament appear as pure geometricalizations of nature, although some personal ornaments from the Bronze Age seem to be of technomorphic origin, and to have originated in the form of small coils of wire. Many examples of the two classes have been found in excavations, principally in Scandinavia, Ireland, Hungary, North Italy, Greece, and Egypt.

Most of these early spirals with the exception of some in Ireland, Greece, and Egypt, were used as decoration upon useful objects—arms, utensils, amulets, and fibulæ. The spirals of Ireland, good examples of which we have surviving to this day, were cut upon stone monuments of one sort or another. Mr. Rolleston, in speaking of the spiral stone decorations at New Grange, Ireland, says: "Except for the large stone with spiral carvings and one other at the entrance of the mound, the intention of these sculptures does not appear to have been decorative except in a very crude and primitive sense, . . . . The designs are, as it were, scribbled upon the walls anyhow and anywhere. Among them everywhere the spiral is prominent. The triple and double spirals are also found, as well as lozenges and zig-zags."†

\* Avebury, "Prehistoric Times," pp. 19, 44, 46, etc. Ward, "Historic Ornament," Figs. 39, 40, 41, 47, 50, 55 and 57. Munro, "Palæolithic Man," Plates LII, XXXIX, LXVIII and LXX. Reinach, "Apollo," p. 13, Fig. 12.

† Rolleston, *Op. Cit.*, p. 70.



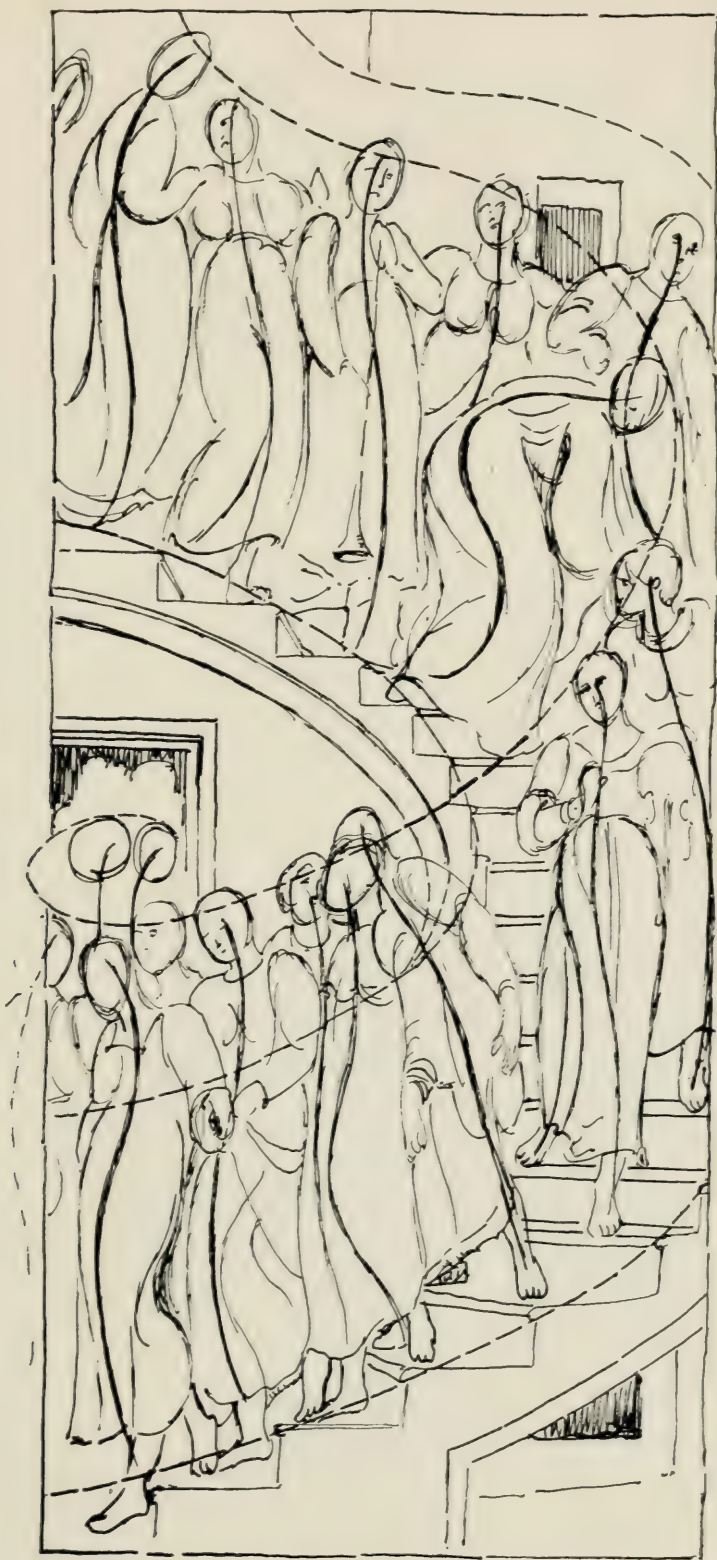


FIG. 3. "THE GOLDEN STAIR" OF BURNE-JONES, AN ANALYSIS

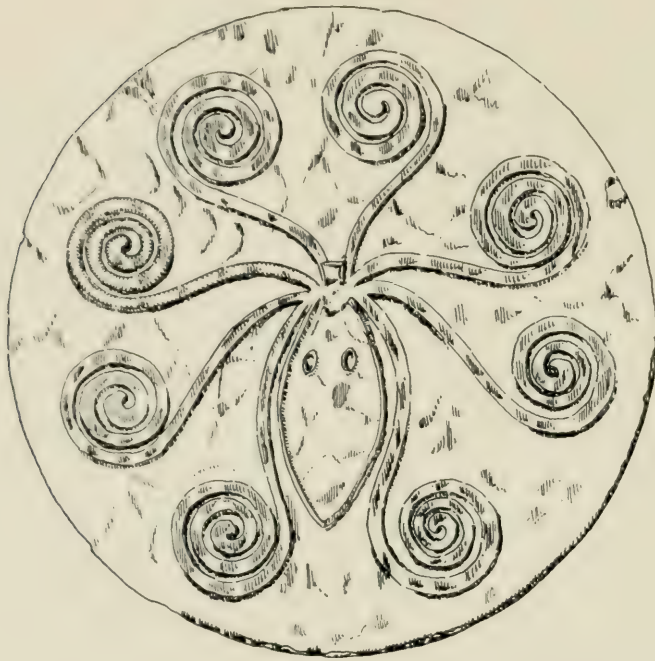


FIG. 4. GOLDEN DISKS FROM MYCENÆ AFTER SCHLIEMANN



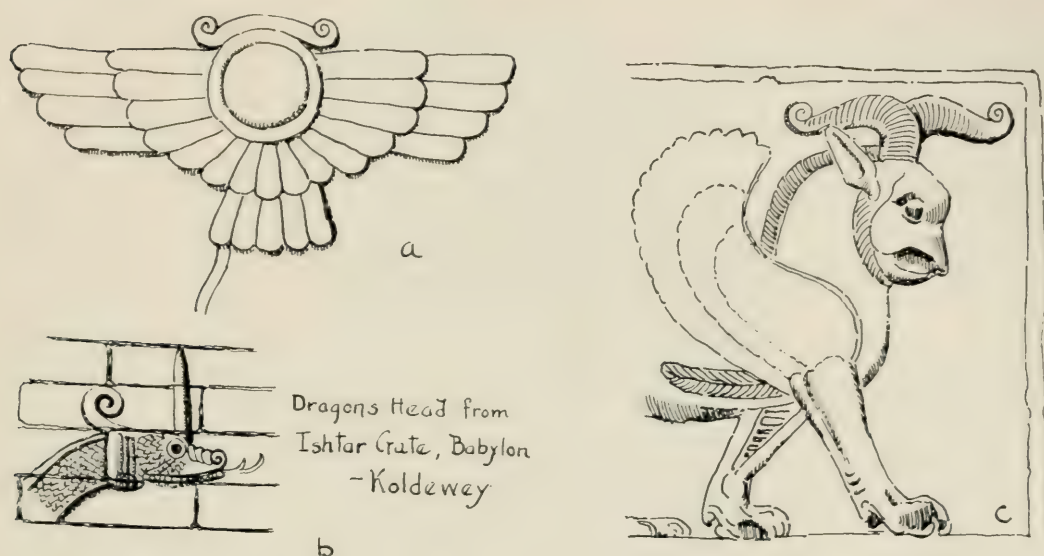


FIG. 5. ASSYRIAN ANIMAL SPIRALS, FROM VARIOUS SOURCES

Lord Avebury\* in remarking on the differences in ornament in the Stone and Bronze Ages of northern Europe shows that circles and spirals were more prevalent in the Bronze Age than in the Stone Age. The Egyptian spirals of earliest occurrence were carved upon amulets and were usually geometrically executed, thus showing that the abstract curve was appreciated and loved aside from its association with any particular natural form. In the early Egyptian amulets the spiral was used as a space-filling motif around the scarabæus.†

This is not true, however, of the spirals executed in a period just a little later in the history of the race. The introduction of metals, bronze, gold, or silver, made possible a much wider artistic expression, and especially was this true in the case of Mycenæ, where have been found such golden disks as are shown in Fig. 4. Here spirals appear, although geometrical in spirit, as the antennæ of butterflies and the arms of octopi. These disks, together with certain vases found at Mycenæ and in Crete, show spiral forms midway between the very abstract spirals of early peoples and the more naturalistic spirals as found in Egypt and especially in Assyria, where antennæ, animal horns, and even hair have been given a spiral turn, but always in a naturalistic spirit‡ and never in a geometric as at Mycenæ (Fig. 5).

\* Avebury, *Op. Cit.*, pp. 19, 44, 46.

† Hamlin, *Op. Cit.*, pp. 51, 53.

‡ See Jastrow, "Civilization in Assyria and Babylonia," Plates 31, 53, etc.

Spirals of floral origin make their first appearance principally in Egypt and Assyria. Perhaps the earliest of this type is the Egyptian lotus spiral. The priority, even here, is a matter of great debate among archaeologists, some maintaining that Egypt originated the spiral motif and passed it on to the Tigris-Euphrates civilization and the Cretans, while others maintain the reverse was true and that the spiral came from Crete into Egypt.\*

6. *In Architecture*.—Bell,† in speaking of the palace of Amen-hotep IV, situated upon the right bank of the Nile two hundred miles below Thebes, says: “It is said that the spiral was first used as an architectural ornament in this building.” However this may be, spirals of distinctly floral origin are to be found as wall and ceiling decorations in the Theban tombs of the eighteenth to the twentieth dynasties,‡ the use of spiral ornament becoming well authenticated and much used from that time on. Nor was the spiral ornament of the lotus type confined to Egypt. Many examples have been found



FIG. 6. ASSYRIAN IVORY CARVING, FROM THE BRITISH MUSEUM

\* Baikie, “Sea Kings of Crete,” p. 142.

† Bell, “Architecture in Ancient Egypt,” p. 82.

‡ 1600 to 1100 B.C. (Berlin dating), 1580 to 952 B.C. (Petrie).



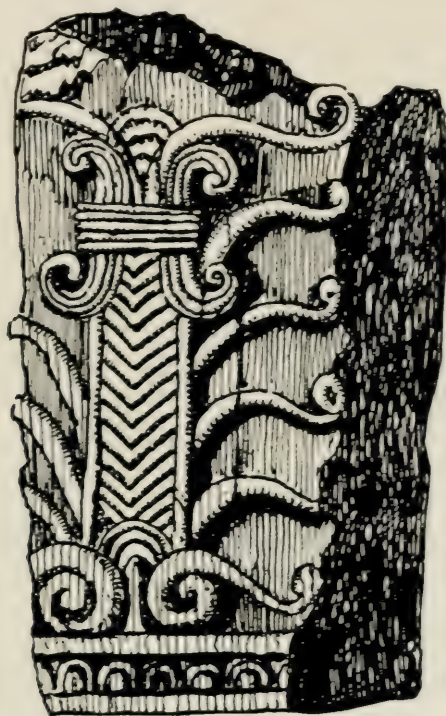


FIG. 7. ASSYRIAN IVORY CARVING. FROM THE BRITISH MUSEUM

in early Greek cultural centers, especially at Mycenæ, in the Palace of Tiryns,\* and upon the ceiling of the flat-roofed chamber of the "beehive" tomb of Orchomenos† in Boetia, which is a well known case. Comparing the last mentioned Greek lotus spiral with the well known Egyptian examples it certainly appears, on account of its less skilful handling of the flower, and its cruder execution, the copy rather than the original.

Other examples of floral spirals are to be found in Babylonia and Assyria. Fig. 6 shows an Egyptian king holding a lotus stalk.‡ This small ivory carving was found in Assyria and goes to prove, among other things, the intimate connection between Egypt and Assyria at a very early period. The interesting thing, however, from the present view point is the voluted leaf at the base of the stalk. Here the spirally inclined forms are leaves and not the flowers themselves.

Another floral spiral form is to be found upon another small carved ivory block from the same case in the British Museum¶

\* See Dürm, "Baukunst der Griechen," plate op., p. 31.

† See Guide to the Babylonian and Assyrian Antiquities, British Museum, 1908, p. 22.

‡ See Guide to the Babylonian and Assyrian Antiquities, British Museum, 1908, p. 22.

¶ Table-case F. No. 87. Nimroud Gallery. British Museum.

(Fig. 7). It represents the Assyrian sacred tree, a highly conventionalized form. The curious thing about these volutes is that they more nearly resemble animal horns than floral forms at all. Near the top of this fragment are shown two pairs of volutes set vertically against the central trunk and bound with thongs. These volutes resemble very closely in form and position the volutes used later, in Persian times, upon the columns of the Propylæa at Persepolis (Fig. 8). In Assyria this use of coupled voluted forms appears to have been widespread, examples in most cases having the curious little point at the division of the volutes noted in Fig. 9. In this connection it will be noticed that in all the Assyrian volutes the spirals spring vertically from the stalk or stem, and always appear as added decoration, and not as in any way related to structure. Mention has already been made of the wave-motion spirals, and spirals of this origin are often encountered in Assyrian ornament. They occur usually in conventional representations of water, the general body of water being represented by parallel chevrons or parallel undulating lines, with here and there a spiral wave. In these Assyrian examples the spirals are isolated\* and not "running" as was true of the "Greek Wave" of a later period (Fig. 10).

These varied occurrences of the spiral in early art around the Mediterranean are introduced to prove the wide distribution of this universally loved curve. The examples present methods of handling so varied in the different countries that the conclusion must be drawn that the volute was developed, even if it did not originate, independently in many widely separated cultural centers. In the cases so far considered in this study the spiral has appeared as a motif of pure decoration used either as a beginning or as an ending motif in connection with other forms, animal or floral, as linear ornament, or as all-over decoration upon plane surfaces; and so far the spiral or spirally-inclined curves have been encountered in Egypt, Assyria, and the Ægean Area, the three early centers of culture as far as classical civilization is concerned. These facts indicate that the spiral form was appreciated in all these countries from very early times. It should also be noticed that the spiral was little used in connection with architecture except in Egypt and the Ægean centers of the Greek mainland, and even there it appeared as applied decoration, sculp-

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\* See Jastrow, *Op. Cit.*, Plates VII and LXIX. Maspero, "Ancient Egypt and Assyria," pp. 256, 257 and 334.



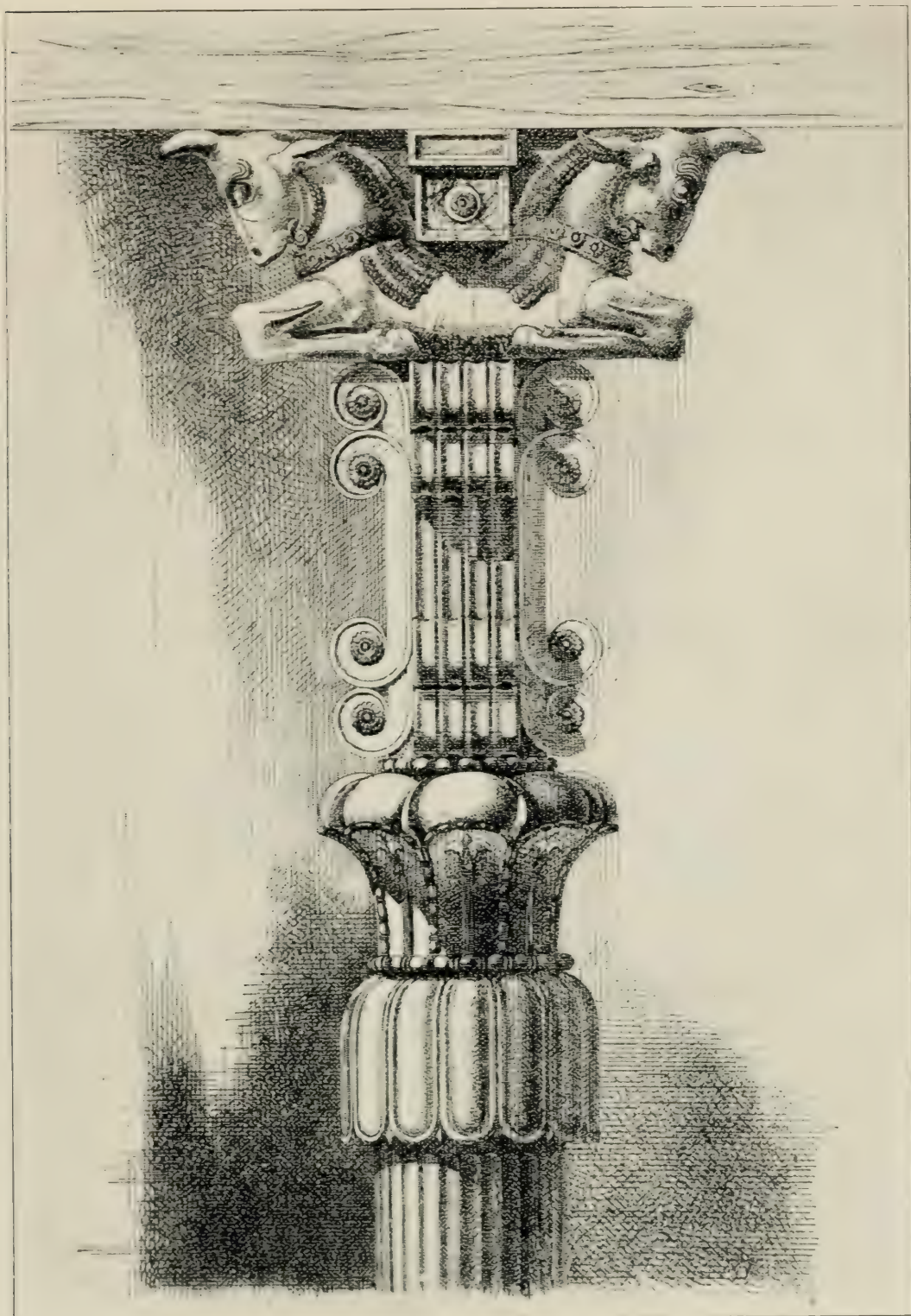


FIG. 8. PERSIAN CAPITAL WITH VOLUTES, FROM DIEULAFOY

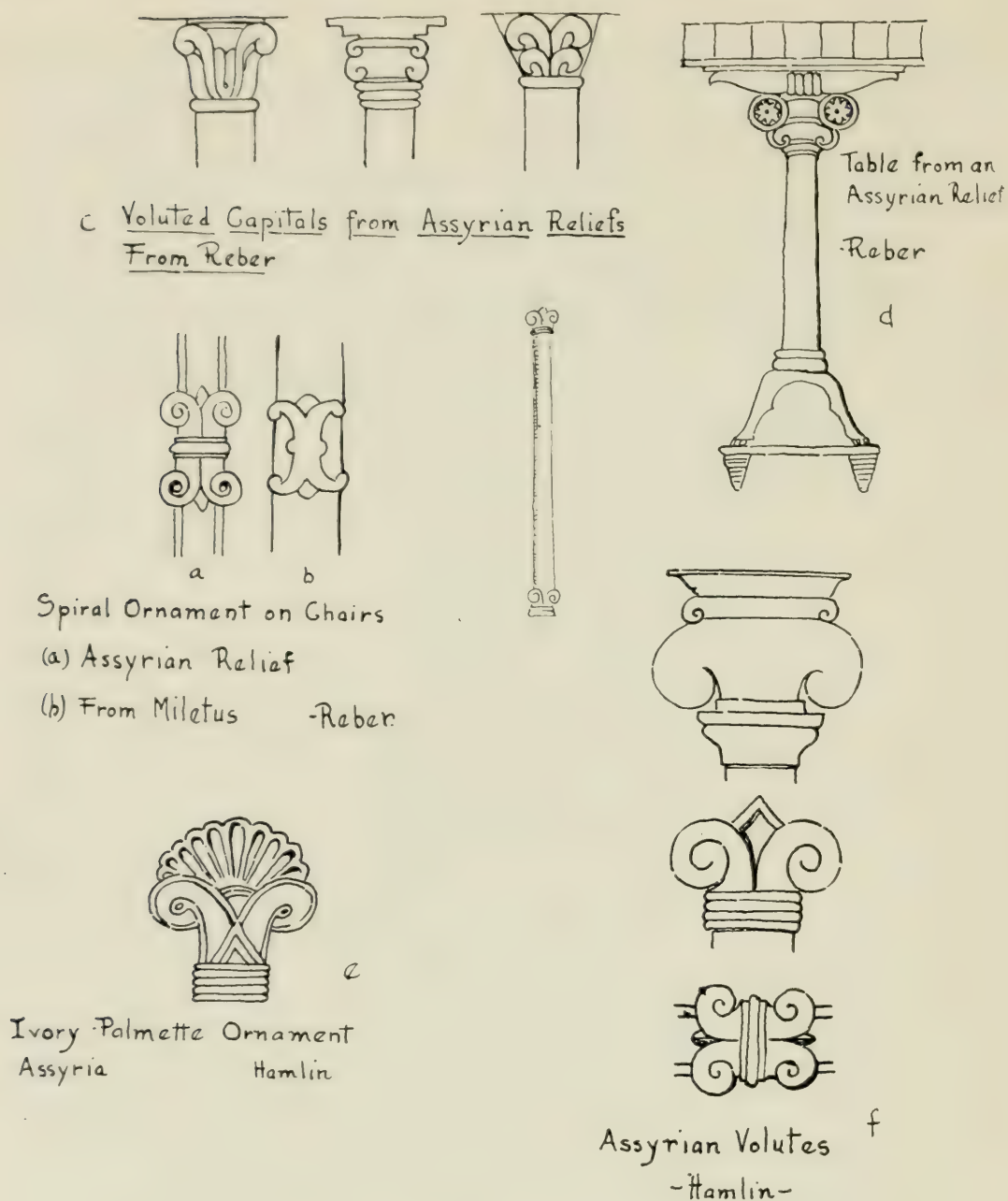


FIG. 9. VARIOUS ASSYRIAN SPIRALS

tural or painted, rather than as pure architectural\* ornament. Far less use was made of the spiral in the Tigris-Euphrates Basin than in Egypt or Greece, and there almost entirely in connection with

\* Pure architectural ornament is ornament suggested or dictated by structure, such as bases, capitals, cornices, modillions, etc.



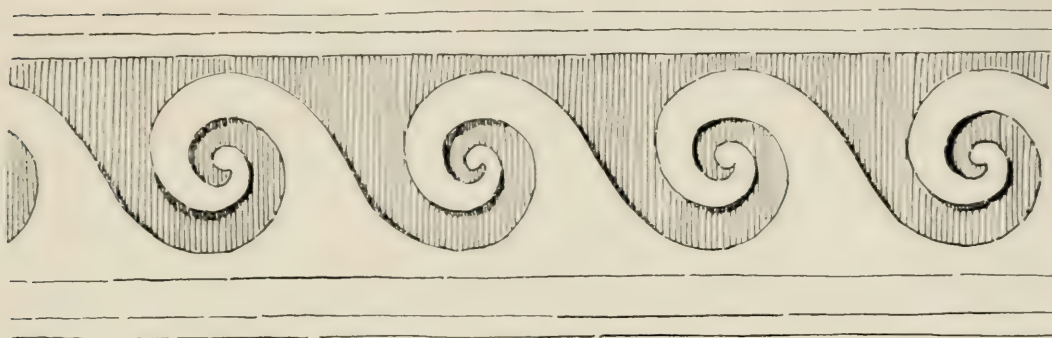


FIG. 10. WAVE MOTIF, TEMPLE OF MARS ULTOR, ROME, AFTER D'ESPOUY

pictorial representation (Figs. 5, 6, 7, and 9), and never as geometric decoration or architectural ornament.

Now the question as to the place of origin and subsequent route of the spiral naturally arises in the student's mind. Did the spiral originate in Egypt, pass into Assyria and then on to Asia Minor and the Ionian lands and Greece, as has often been claimed, or did it pass with the Ionians in the migration from Boetia and Attica to Ionia on the west coast of Asia Minor?

At first the settlement of this question would seem to have little bearing upon the question of the origin of the Ionic capital. A spiral would seem to be a spiral by whatever route it arrived. But in reality, the settlement of this question will determine whether it will be necessary to consider the Ionic capital as having been developed from the decorative, spirally-inclined, floral motive of Assyria into the structural motif of Ionia, or whether it will be possible to see in this form the indication of a lost structural prototype. If it came from Assyria, decoration preceded structure,\* and the perpetuation of a decorative form occasioned the introduction of a structural entity; if it came from Greece, it may be possible to account for the structural origin of the capital first, and then its decoration as a logical elaboration of that structure.

The question as to whether the spiral came from Egypt into early Greece, i.e., Crete, Boetia, and Mycenæ, need not be considered here. It is not vital to the discussion whether this or the reverse† was true. In early Greek art is to be found, in both the hand-crafts

\* This is the explanation of the origin held by all adherents of the decoration theory.

† As Hall (H. R.) and Evans contend.

and architecture, the geometrical spiral as contrasted with the spirally-inclined decorative forms of Assyria. The question stands: Did the spiral go to Ionia by way of Greece or by way of Assyria?\*

The Ionians, in the time of Herodotus, claimed to have inhabited twelve cities in the northern Peloponnese and to have been driven from these cities into Attica by the Achæans, who were in turn driven out by the on-coming Dorians.† From Attica they were led by the son of King Codrus of Athens to the Asiatic coast, where they settled at Miletus. Lang,‡ in summing up the movements of these people, says: "It thus appears that the people later called, in Asia, 'Ionians,' had been dwellers on the coasts of Boetia and Attica as well as in the northern Peloponnese." The composition of the people known as Ionians of Asia Minor is not plain. Herodotus describes them as a "mixed multitude" and includes among them Phocians, Arcadians, Cretans, and others.§ The name,§ no doubt, was applied after the arrival of the emigrants in Asia.

The time of the Ionic migration is as yet not definitely settled, but late research places it after the Dorian invasion, and thus after the Ægean period of Greek history. "Without assuming any definite date, we may say," says Sir Edward H. Bunbury, "that recent research has tended to support the popular Greek idea that Ionia received its main Greek element rather late, and therefore after any part of the Ægean period."\*\*\* These conclusions are based upon archaeological finds, and archaeology is now depended upon to solve the Ionic question.†† In the absence of architectural remains of the earliest Ionic period that would prove, beyond a doubt, the origin of the Ionic order, other archaeological evidence must obviously be considered.

Due to the excavations of Schliemann, Evans, and others, some idea of the culture that flourished before the departure of the Ionians for Asia Minor is possible. The resemblance between the structures

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\* A mass of evidence, not to be overlooked, is encountered in the finds upon the Danube and Po Rivers, in Scandinavia and in Ireland. Why is Assyrian influence not found in these spirals?

† Lang, "World of Homer," p. 140.

‡ Ibid, p. 142.

¶ Leaf, "Homer and History," pp. 66, 296-297.

§ After their fabled leader, Ion.

\*\*\* Bunbury, "Ionia," in *Encyclopædia Britannica*, 11th Edition.

†† Hogarth, "Ionia and the East," p. 12.



of Sparta,\* in the Peloponnese, and one found at Neandria,† in the Troad, has been remarked by other writers. The votive objects found at Sparta include pottery in the "geometric post-Ægean style," together with ivory-covered fibulæ bearing many Ægean motifs, among which is the "double-coil," also characteristic of the Po and Danube Valleys.‡ The objects found upon the site of the Ionic Temple of Artemis at Ephesus (700 B.C. ?), as a result of the excavations of Mr. Hogarth, serve to show the intimate relationship of early Ionic art of Asia to that of the Greek mainland. Here Mr. Hogarth found thousands of votive offerings in gold, bone, ivory, paste, and crystal, ornamented with well accepted Ægean motifs, such as the "spectacles," a kind of double spiral, the "bouble axe" spirals, two animals opposed in heraldic fashion.§ These finds|| which he dates from about 700 B.C., or about two hundred years after the traditional migration, bore a closer resemblance to pure Ægean work than did the contemporaneous work in Greece. This fact will not seem strange, perhaps, when the mixture of blood taking place upon the mainland due to the immigration of northern elements is considered.

Attention is called to this same resemblance between the Ionic minor arts and those of the Mycenæan centers by Fowler and Wheeler,\*\* who say: "In general it may be said that in the development of early Ionic ceramic art there are found more reminiscences of Mycenæan art than appear in the early styles of Greece proper, and this fact is rightly deemed of high importance, since the direct relation of Mycenæan art with that of Greece is as yet insufficiently established. . . . Motives taken from plant life are characteristic and point very likely to a Mycenæan survival." Mr. J. H. Hopkinson†† recognizes the "Sub-Mykenean" character of the ware of the Ionic Islands.

Professor John L. Myres‡‡ of Oxford, in speaking of Ionic culture, says: "Ionic culture and art, though little known in their earlier

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\* The Spartan finds were made within the precinct of Artemis Orthia at Sparta by the members of the British School of Athens. It is described as "the remnants of a temple in crude brick with wooden framework."

† Lang, *Op. Cit.*, p. 145.

‡ Munro, *Op. Cit.*, pp. 385, 415, 467.

§ As upon the Gate of the Lions at Mycenæ.

|| There is no doubt now that these were executed in the temple, as goldsmith's refuse has also been discovered there.

\*\* Fowler and Wheeler, "Greek Archaeology," p. 455.

†† Hopkinson, *Journal of Hellenic Studies*, XXII, p. 47.

‡‡ Myres, "Ionians," in *Encyclopædia Britannica*, 11th Edition.

phases, derive their inspiration on one side from those of the old Ægean (Minoan) civilization, on the other from the oriental (mainly Assyrian) models which penetrated through the Hittite civilization of Asia Minor.\* Egyptian influence is almost absent until the time of Psammetichus, but then becomes predominant for a time." Thus it will be seen that the culture carried into Asia Minor was Ægean and that there is a question as to the extent of the so-called Hittite influence upon the Ionian Greeks, who occupied a situation very near to Greece proper but considerably removed from the center of Hittite power. Here again must be recalled the wide difference between the spirals of Greece proper and those of Assyria.

The great number of true geometric spiral ornaments† occurring upon the Greek mainland during the Ægean period, as well as the general use of spirals of single and double roll in the valleys of the Danube and Po, must indicate something of the derivation, or at least the early distribution of this form, so far as the north side of the Mediterranean is concerned. The wide prevalence of this form is one of the striking archaeological facts in connection with the arts of primitive peoples from Greece to Ireland. Upon the other hand the spiral ornaments of Assyria, Persia, and the Tigris-Euphrates Basin in general, are not pure geometrical spirals, such as we have in Ireland, the Danube Valley, or at Mycenæ and Knossos, but are spirally-inclined curves used in connection with other forms principally animal and vegetable. Had the use of the spiral among the Assyrians been anything like as widespread as among the Greeks, the excavations would surely have yielded some examples before now. Moreover, the absence of any spiral architectural ornament such as has been found in Greece from the earliest of times, certainly argues against the possibility of the volute having come from the East. The origin of the Ionic spirally-decorated capital must be sought not in Assyria but in Greece, or at least among Grecian peoples; and furthermore, too much emphasis should not be placed upon spirals which, from all appearances, are after all only decoration for a form that called for such decoration, and not the inspiration of that form in the first place. One must look further and beyond this decorative feature for

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\* Hogarth, under "Hittites," *Encyclopædia Britannica*, says: "The Greeks came too late in Asia Minor to have any contact with Hittite power, obscured from their view by the intermediate and secondary state of Phrygia."

See *Spiral Fibula*, "The Argive Heræum," Vol. II, Plate 85.



the origin of the form. The shape, the configuration of parts, had to exist structurally before it could be decorated at all.

An intensive study of architectural evolution has led to the conviction that what is at one time structure becomes, in a succeeding age, decoration. There are many examples to prove this law in architectural evolution and in other evolutionary processes as well. In biology there is the case of organs that persist long after their function has ceased. In art the mind demands, after long association, the perpetuation of forms that have ceased to have a significance, and these elements persist always as ornament upon succeeding structural forms. If the old\* theory of the origin of the Ionic order be true, and the structural volute of the Ionic capital be derived from the decorative Assyrian floral volutes, it is the only example of a reversal of the foregoing law with which the writer is acquainted. The old theory stands at variance with all the ages of architectural experience, and this fact in itself serves to make the theory questionable.

Semper,† a German architect-critic, appears to have been among the earlier devotees of the Assyrian palmette theory, in which he derives the Ionic capital from the Assyrian palmette by a "process of gradual suppression of the leafy part and an increase of the scroll." Dr. Clarke‡ further elaborates and supports the theory of Semper. Goodyear sees no reason for seeking an Assyrian origin when evidence of direct lineage from the Egyptian lotus is so apparent. Marquand¶ seems to agree as to this origin of the motif, when he says: "This type of decoration seems to have been derived from a floral prototype, possibly that of the Egyptian lotus." It will be noted that in each of these cases the decoration and not the form itself seems to have received the major consideration.

This purely decorative origin of the voluted capital has, however, been questioned by others. The contentions of Hittorff and Viollet-le-Duc, French authorities, have been well summed up by Professor Dürm in his "Baukunst der Griechen," when he says: "Diese

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\* See Goodyear, *Op. Cit.*, pp. 115-137.

Hittorff and Zanth, "Architecture antique de la Sicile," p. 335, Note 1 (Atlas, Plates 80-82).

Fletcher and Fletcher, "History of Architecture," p. 77.

Perrot and Chipiez, VII, Plates 52 and 53.

† Semper, "Der Stil in den technischen und tektonischen Künsten."

‡ A Proto-Ionic Capital from the Site of Neandria, *American Journal of Archaeology*, Vol. II, p. 1, 1886.

¶ Marquand, "Greek Architecture," p. 195.

Umstände haben wohl Hittorff und Viollet-le-Duc schon vor langer Zeit bei ihren Erklärungen des jonischen Kapiells veranlasst, das geschnitzte oder geschnitzte und bemalte Sattelholz als Ursprungsmotiv anzunehmen. Seine Form in Stein übertragen—unter Berücksichtigung der Materialeigen thümlichkeiten, also unter Vermeidung der zu grossen seitlichen Ausladungen—wird zum jonischen Säulen-Kapitell, besonders wenn dem Stammende noch eine entsprechende Bekrönung zugefügt wird.’’\*

Here there is at least an attempt, and a very plausible attempt, to explain upon structural grounds the origin of the capital. One would scarcely question the opinion of such distinguished authorities upon a problem of this sort. They were convinced, evidently, of some sort of structural origin for the capital. A similar conviction has led to a search for a more conclusive theory than that set forth by either Hittorff or Viollet-le-Duc.†

The wooden bolster-cap theory has appeared logical and in accordance with the early examples, but, upon the other hand, not quite the whole story. Why should the spiral, even though it was, as has already been shown, very much loved and universally used in decoration, have suggested itself as a capital decoration, especially when its carving upon the wooden bolster-cap meant the carving of the spiral across the grain? The longitudinal dimension of the volute cylinder would naturally be expected to run with the grain. These considerations have led to a search for a further explanation; and in this connection some preliminary assumptions have been made. In the first place, the fact that the Ionic capital presents two very different aspects depending upon whether one views the capital front-on or from the side, leads to the assumption that originally the form was placed so as to be seen from front or back and not from the side; this assumption accords with its use in many places in Asia Minor, especially upon such rock-cut tombs as those of Amyntas, and others in Lycia;‡ secondly, the volute cylinders standing normal to the plane of the façade, as they do, must be, since they indicate structure, the descendants of a former structural form now obsolete by virtue of a change of materials; thirdly, the attenuated proportions of the Ionic shaft point to a wooden origin, which has been assumed; and lastly, the omission of the frieze upon many of the early buildings

\* Dürm, "Baukunst der Griechen," p. 246.

† Viollet-le-Duc, "Entretiens sur l'architecture," Lecture II.

‡ See Sturgis and Frothingham, "History of Architecture," Figs. 147, 148, 153, etc.



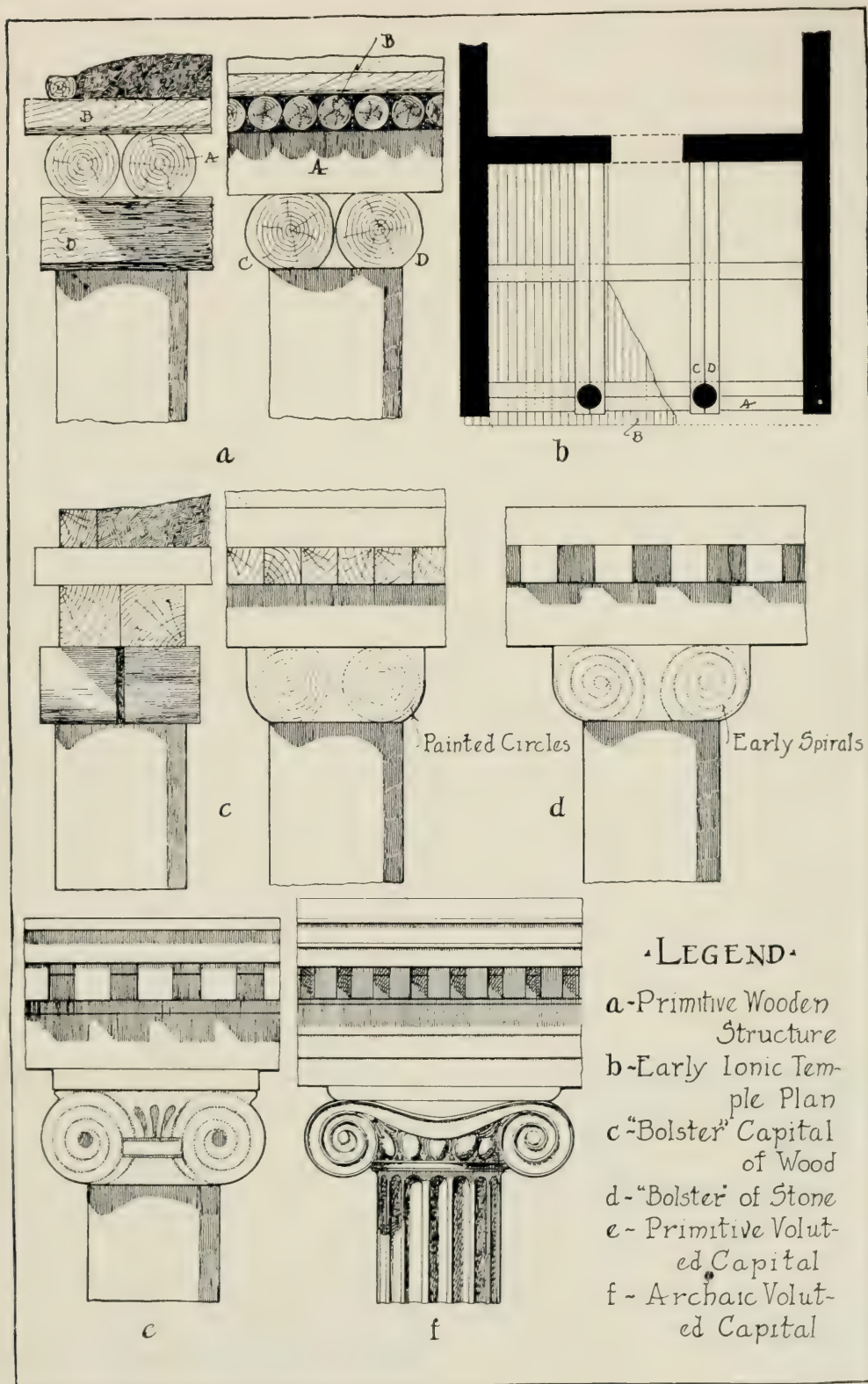


FIG. 11. EARLY DEVELOPMENT OF THE IONIC ORDER, A CONJECTURAL STUDY

in Asia Minor, and the enormous size of the dentils, are circumstances which necessitate a further investigation for a possible wooden origin, and an explanation that takes into account the structural significance of the capital, making it an integral part of the structure.

In any wooden restoration the architrave, obviously, becomes a row of beams spanning the distances between columns. These beams are indicated by A in Fig. 11a. A study of the Asia Minor tombs seems to indicate that the dentils were originally beams, or at least wooden members, running normal to the direction of the architrave. This structural significance of the dentils has long been held by many authorities and universally appreciated. These are restored as wooden beams at B, Fig. 11a. A study of the plan of the typical peristyle ceiling, seen from below, shows beams running back from the columns normal to the architrave (Fig. 12). This would indicate that, in primitive times, there must have been a member at least as important as the architrave spanning the distance between the columns and the wall. In Fig. 12 it will be noted that this beam is much heavier than similar beams running perpendicular to it due to the fact that these smaller beams are borne upon it. In making the restoration shown in Fig. 11b, following the structural logic of primitive peoples, who often double or triple structural units in order to produce greater strength, two beams have been substituted for each of the heavier ones shown in Fig. 12 and one beam for each of the smaller ones. Since, unquestionably, the earlier Ionic temples were *distyle in antis* on plan, there was no peristyle, and the row of columns upon the flank, shown in Fig. 12, became a wall. (See Fig. 11b.) The double beams C and D suggest, at their ends, the cylinders of the Ionic capital.

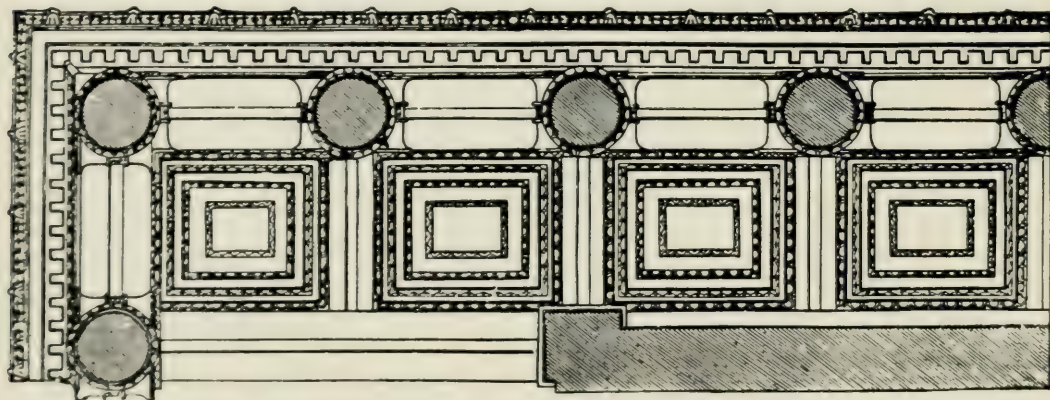


FIG. 12. CEILING PLAN, PERIPTEROS, MAUSOLEUM OF HALICARNASSOS, FROM REBER



But whence the volutes? It has long been noticed that, in primitive art, spirals and concentric circles have been used concurrently. This was true at Mycenæ, in Crete, and no doubt in Asia Minor. This tendency has been remarked by Haddon\* and Dr. Montelius, both of whom noticed that series of circles, when joined with recurved lines, as is often the case upon the gold disks of Mycenæ and upon similar objects found in Central Europe, Scandinavia, and Ireland, have the appearance of spirals unless very closely observed. Indeed, this illusion is so prevalent that Dr. Montelius has called the form a "bastard spiral." Both these writers consider the concentric circles as degenerate spirals, but their arguments are applied to the use of spirals among primitive peoples. Now among very primitive peoples the truth of the argument may perhaps be granted, but it is scarcely permissible in the case of the Ionic Greek artist. The tendency of the artist in the ascendant period of Greek art was to seek refinement, rather than to reduce any of his art to rule of thumb or easy mechanical equivalent, a procedure which cheapened Roman work. With the log ends in use, the next natural consideration would be their decoration, and the concentric annular rings of the log suggested a set of concentric circles as ornament. This ornament was at first no doubt painted on and, indeed, the practice of painting these concentric circles upon the capital may have been continued long after the form suggested by the log ends had become the "bolster capital" of Hittorff and Viollet-le-Duc (Fig. 11c). Since it would have been difficult for these early people to carve wood across grain, especially if the pattern were that of concentric circles or spirals, it is reasonable to believe that the sculptural delineation of the ornament upon the capital may not have been practiced until after the translation of the capital into stone (Fig. 11d).

How long it took the concentric circles to become many-whorled tangent elementary spirals would be difficult to say, but probably the concentric circles persisted until after the log ends had given way to the "bolster capital" and, indeed, may have persisted down to the adoption of stone, but so far no capitals, however early, have been turned up that carry the concentric circles. On the other hand the earliest known capitals present primitive tangent many-whorled spirals, the sculpturing of which is so flat that the spirals seem scarcely

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\* Haddon, *Op. Cit.*, p. 93.

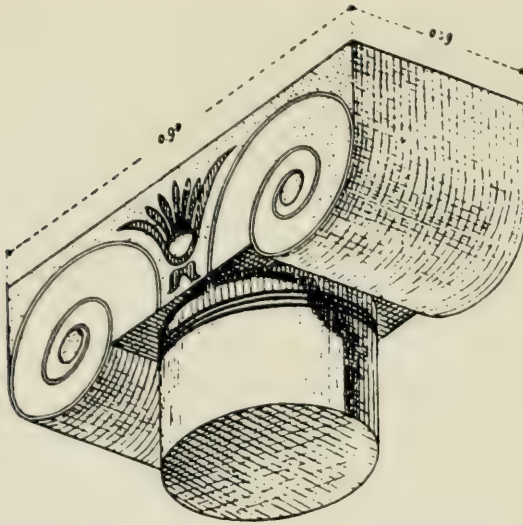


FIG. 13. IONIC CAPITAL FROM DELOS, FROM PERROT AND CHIEPIEZ

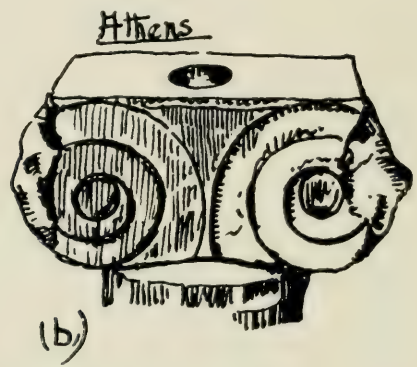
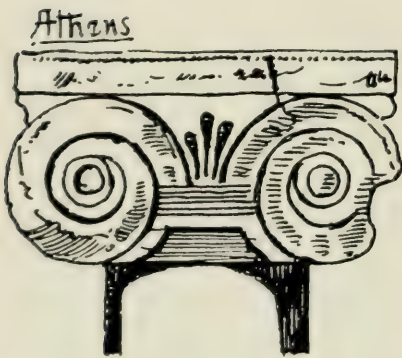


FIG. 14. ARCHAIC CAPITALS FROM ATHENS, AFTER DÜRM

more than shallow scratches upon the surface of the block. Indeed, so primitive are the Athens capitals (Fig. 14) that they appear almost as stone translations of the log ends, which persist now only as ornament, the beam itself having been raised to the level of the architrave and not indicated upon the elevation at all. These archaic



capitals from Athens are the most primitive Ionic capitals yet brought to light; and this fact has led some authorities to hold that the Ionic capital was developed in Greece proper. In these examples there has been no attempt to connect the volutes. There is on the more primitive of the two examples shown (Fig. 14*b*) no intermediate "palmette" as upon that shown in Fig. 14*a* and upon later capitals, and the projection is not great; Fig. 14*a* shows a tendency toward the linear type which has been called, for the sake of clearness, the "bolster" Ionic.

Obviously, the translation of this wooden structure into stone occasioned considerable modification, and it would seem in the light of some of these early Ionic capitals that some modification had already taken place before this change from wood to stone. The intermediate form between the conjectural wooden type shown in Fig. 11*a* and such capitals as those from Delos (Fig. 13) must have been a type very similar to the "bolster" capital of Hittorff or Viollet-le-Duc. In the Delos capitals the wide separation of the volutes and the general linear tendency points to a "bolster" cap prototype. Marquand\* has pointed out this tendency in early Ionic capitals when he says: "The essential rectangularity of the Ionic capital is most evident in an archaic example from Delos, in which a single rectangular block has been but slightly modified in form." This rectangularity of some of the early capitals accounts, no doubt, for the bolster-block theory of the French authorities.

In these primitive types the echinus is omitted and thus it would seem to have been a later refinement. Its introduction dates, doubtless, from some time after the change in materials from wood to stone, and it may be only the echinus of the Doric capital used as a support for the voluted "bolster-block," the volutes of which naturally had to be separated in order to make a nice union with the echinus.

Such capitals as those found at Neandria in the Troad (Fig. 15), and Messa in the Island of Lesbos (Fig. 16), appear as elaborate attempts to make the early spiral capital born of structure a decorative form. Even here the spirals appear distinctly Ægean in character rather than Assyrian, being spirals of several turns, while most of the Assyrian volutes are only spirally-inclined forms. In these cases some oriental influence may be granted, but this would not nullify the arguments in favor of a structural origin. Oriental forms are

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\* Marquand, *Op. Cit.*, p. 92.

chiefly decorative and rarely simply structural, and Ionic artists may have welcomed some suggestion to make the new structural form decoratively agreeable. On the whole, however, it seems that the Assyrian influence upon Ionic peoples has been tremendously exaggerated. No Assyrian voluted capitals are known, unless the very crude spirally-inclined capitals copied from Assyrian wall paintings (Fig. 9) should be called voluted capitals.



FIG. 15. IONIC CAPITAL FROM NEANDRIA, AFTER DÜRM



FIG. 16. IONIC CAPITAL FROM MESSA, AFTER DÜRM

It is strange that these forms should appear in wall paintings and yet not be realized in excavation, and thus appear in the guise of fanciful conventions of the artists rather than as living forms of architecture. It is probable also that had the voluted capital been known and used by the Assyrians it would have been perpetuated by their successors the Persians. The only Persian capital with volute decoration is that found upon the Propylæa at Persepolis (Fig. 8).



Here the volutes are used in the truly oriental decorative manner, a spiral decoration against a vertical member, a method noted in Fig. 7. Its late date, 480 B.C., would exclude this example from any consideration in studying the origin of the Ionic capital.

The earliest well authenticated example of the Ionic voluted capital is that from the Archaic Temple of Diana (Artemis) at Ephesus, which dates from 550 B.C., and is now preserved in the British Museum (Fig. 17). It is certain that the archaic capitals from Athens

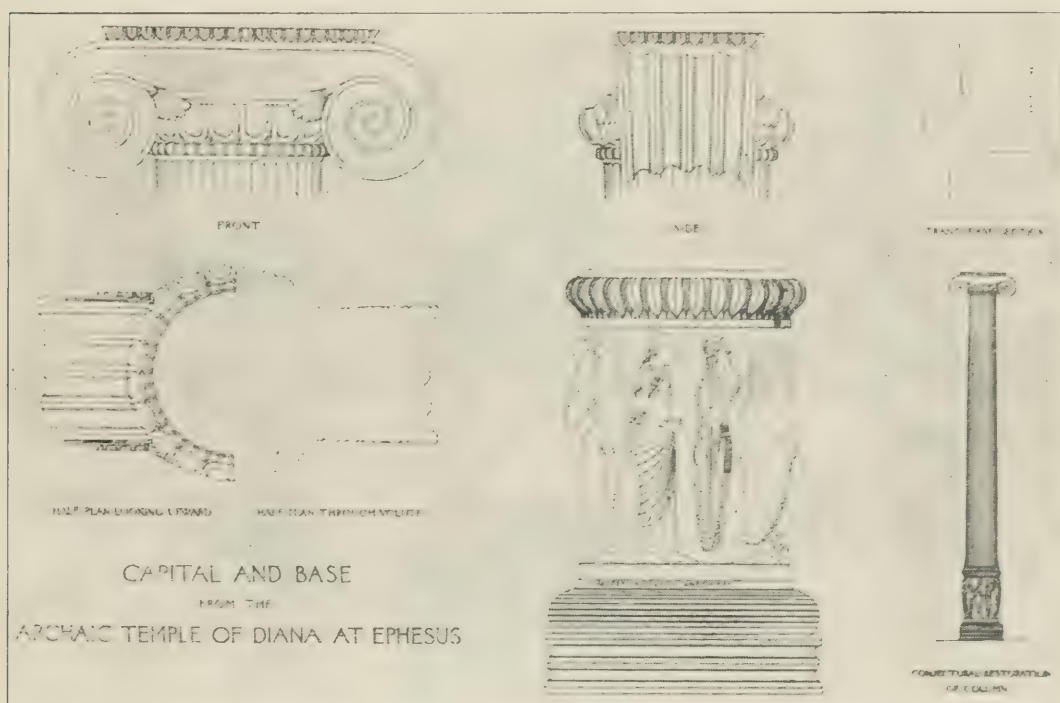


FIG. 17. IONIC CAPITAL FROM THE ARCHAIC TEMPLE OF DIANA, EPHEBUS, FROM ANDERSON AND SPIERS

(Fig. 14), Neandria\* (Fig. 15), the Naxian votive column capital (Fig. 18), and the capital from Naukratis† (Fig. 19), appear older

\* Koldewey holds that the Neandrian capitals are not proto-Ionic but a new type which he calls "Æolic." This capital with its vertically springing spirals is certainly more reminiscent of the Assyrian wall-painting spirals than any so far discovered. Yet even here may be seen, after all, an attempt actually to carve in stone the spiral ornament painted upon the block capitals of Athens.

† Naukratis was a center of cultural activity during the Ptolemaic Period, and just previous to the founding of Alexandria was the chief trade center of lower Egypt. It was given as a trading place to the Greek traders by Psammetichus I and due to the supremacy of the Greeks temples were built there to Greek gods. The capital referred to, the volutes of which are missing, is said to have come from a temple of Apollo. See King and Hall, "History of Egypt," p. 436.

than the Ephesian capital, principally upon account of their naïve archaic composition, but just how much older is a question. Anderson and Spiers\* consider the Naukratis capital, an example discovered by Professor Flinders Petrie, and dated by him at about 650 B.C., the oldest capital of this variety known; but it must be admitted that the votive column of the Naxians at Delphi has claims to a greater age† than the Naukratis capital. Especially will this be noted in the insufficient attempt in the Naxian column to stop the flutes under the

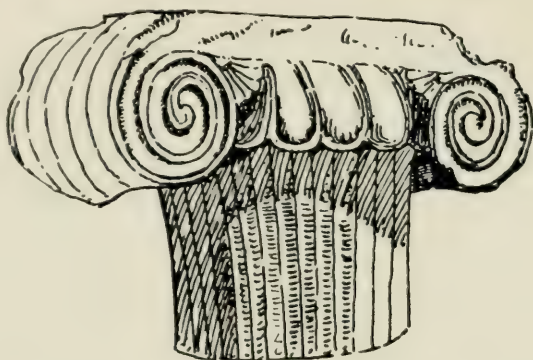


FIG. 18. NAXIAN VOTIVE COLUMN CAPITAL, DELPHI, AFTER ANDERSON AND SPIERS

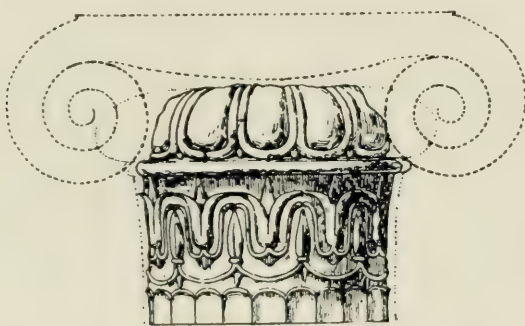


FIG. 19. CAPITAL FROM NAUKRATIS, EGYPT, FROM ANDERSON AND SPIERS

embryo echinus, a thing which is adequately accomplished in the Naukratis capital.

It is a failing of historians and archæologists to place anything found upon Egyptian soil in the list of Egyptian antiquities and to attribute to all Egyptian finds a great age. The Naukratis capital is clearly an Egyptian‡ interpretation of a Greek form entirely out of keeping with Egyptian thought, even of the Ptolemaic Period, but no doubt done upon Egyptian soil by Greek artists.

\* Anderson and Spiers, "Architecture of Greece and Rome," p. 56.

† Upon the basis of internal evidence.

‡ Egyptian, in the sense that it was discovered upon Egyptian soil.



The difference between the Archaic examples from Athens and the Naxian capital is even more pronounced than the difference between the Naxian and the Naukratis types, and, from internal evidence, these capitals represent the most archaic Ionic type. In view of these finds at Athens it may be necessary to admit eventually that the earliest voluted capitals were developed in Greece, and carried into Ionia, where they were elaborated and modified decoratively by virtue of oriental association. The internal evidence\* of course is not conclusive and the matter must be left thus until further finds of archaic types are reported. All the evidence so far presented, however, indicates that the Ionic voluted capital is not the product of Assyrian decoration but the development of a Grecian, or perhaps an Ægean, structure. Its birthplace was in the west of that day, not in the east (Tigris-Euphrates Basin).

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\* The internal evidence may indicate either of two things:

- (a) a more primitive type of development, or
- (b) a retrogression from an advanced type, due to a barbaric handling.

#### IV. THE VOLUTE AS A FEATURE OF THE CLASSIC ORDERS

7. *The Ionic Development.*—In the appendix is given a chronological arrangement of the various historic specimens of the Ionic voluted capital, but before discussing the voluted forms subsequent to the capital from the Archaic Temple of Diana at Ephesus, some summary should perhaps be made of the handling of the volute as a feature of the Ionic capital up to that time.

Upon the archaic examples from Athens (Fig. 14*b*), no attempt is made to connect the spiral ornaments of the block. In Fig. 14*a* there is apparent an attempt, naïve as it is, to join the two spirals in some kind of a composition. Here perhaps is found a reference to a floral inspiration, a thing very natural when the general use of spirals that had been made in Greece up to this time is remembered. In each of these examples the spirals spring vertically from the shaft, perhaps in obedience to the principle that transition from a vertical to a horizontal should be emphasized. In the case of Fig. 14*b*, however, the ornament does not suggest a floral derivation, and the spirals are so close together as to indicate that the ornament was meant to be abstract and not suggestive of any particular form.

In the Neandrian capital, which has been heralded as a distinct type by Koldewey, the spirals still spring vertically, and there is some attempt to fill the triangular space with floral ornament. This capital betrays most clearly its inspiration, and appears as an ultra-decorative version of the voluted form, rather than as following the line of development that culminates in the Ephesian capital.

In the case of the capital from Delos (Fig. 13) there is more of an attempt to unite the volutes, which here spring horizontally; but even here they still are separated by a small floral form. The echinus which later forms an important part of the Ionic capital, here becomes prominent, and, although the projection of the volute is still very great, and the unfluted shaft makes a poor junction with the echinus, unmistakable signs of development are apparent.

With the Ephesian capital there comes a complete union of the volutes, although the great projection sidewise is still a feature. In



this example also is found for the first time the cushion used upon the horizontal portion of the volutes, a feature which gives the Greek Ionic examples much of their grace and lightness, and a feature which was discarded later, due most likely to the increasing importance of the echinus, much to the detriment of the form.

From the Archaic Temple of Diana at Ephesus it is possible to trace the development of the Ionic capital to its perfection upon the Erechtheum. This can be done by a study of Figs. 20, 21, 22, and 23. The subsequent story of the Ionic order, its introduction and use at Rome, and its revival during the Renaissance, as well as its general employment during recent times, are matters of most common knowledge. It has not seemed necessary to review this mass of material so familiar now to the layman as well as to the student and architect, except perhaps in a pictorial way, and to this end a set of illustrations has been included (Figs. 24, 25, 26, 27, 28, and 29).

8. *The Corinthian Capital.*—Something of the use of voluted forms upon bell or basket-shaped capitals should be recalled here. This use of the volute is found not only upon the Corinthian capitals of Greece (Fig. 32), and Rome (Figs. 33, 34, 35, 36, and 37), but also upon such bell-shaped capitals as that from Philæ (Fig. 31), an example dating from the Ptolemaic Period and due most likely to Grecian influence. Fig. 30 will serve to recall the revival of this type during the Renaissance. But this use of volutes is now very generally appreciated, and these illustrations should serve to delineate the general trend of that use.



FIG. 20. CAPITAL FROM THE TEMPLE OF NIKÉ APTEROS, FROM D'ESPOUY



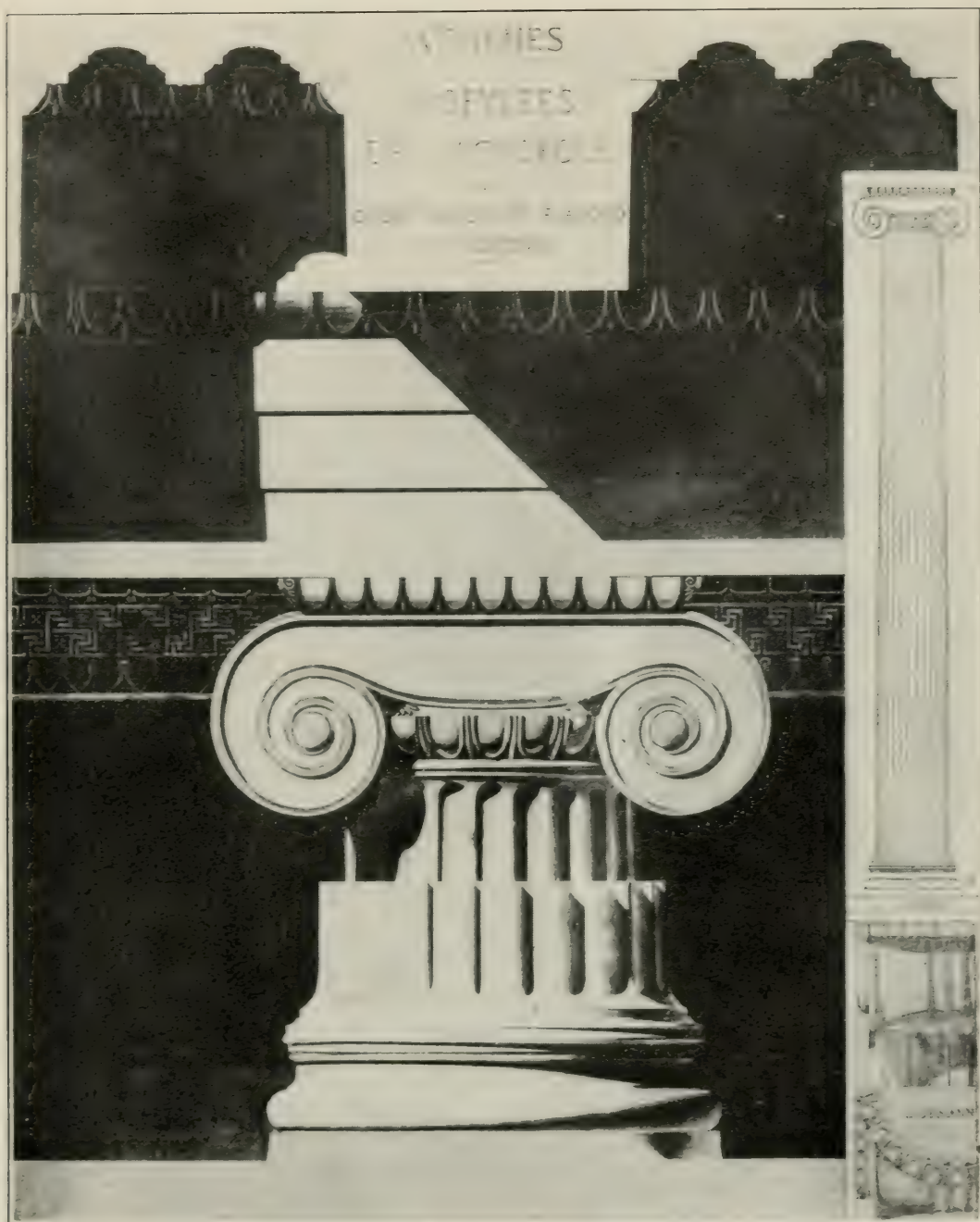


FIG. 21. CAPITAL FROM THE PROPYLÆA. ATHENS,  
FROM D'ESPOUY





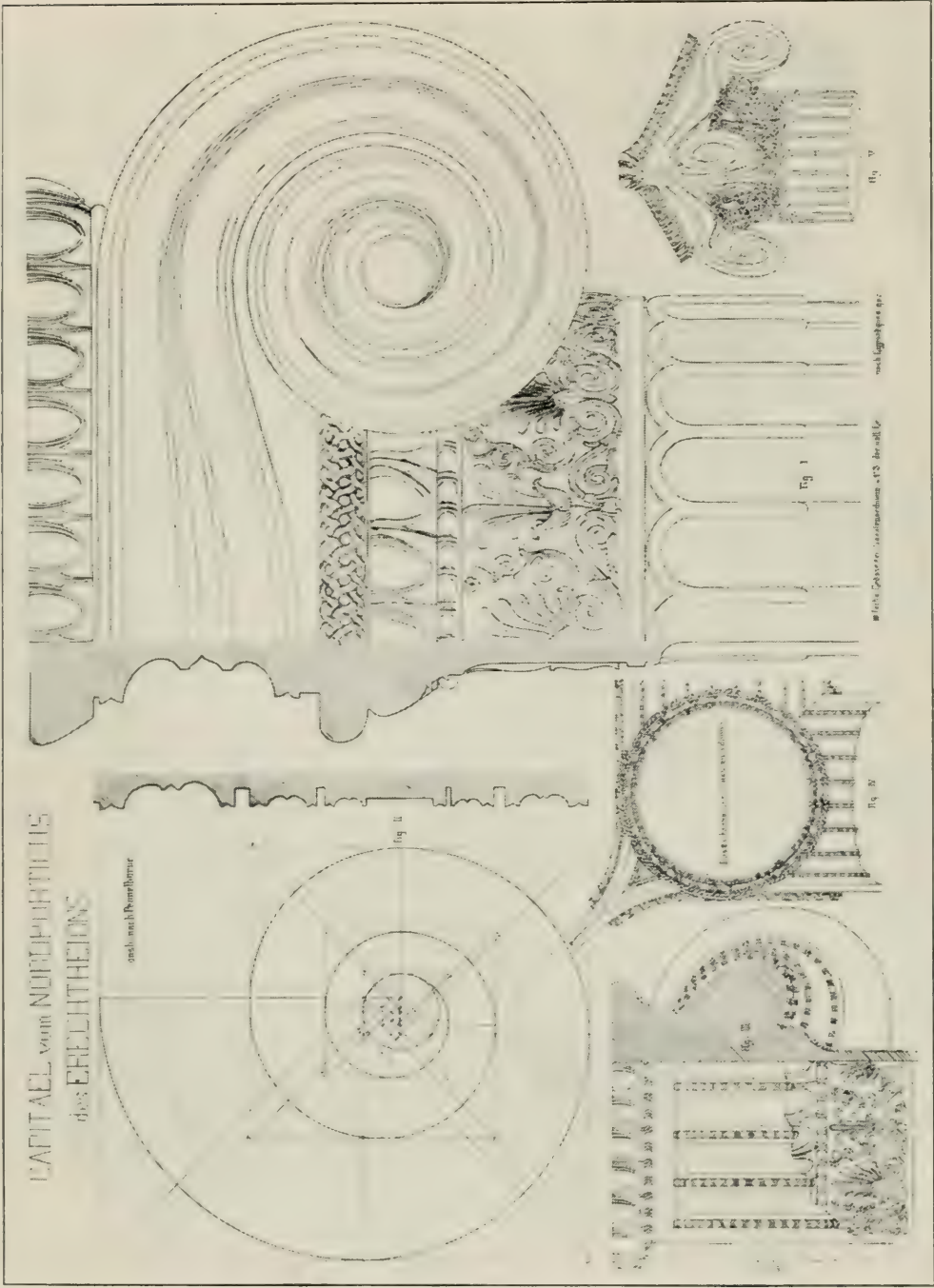


FIG. 23. CAPITAL FROM THE ERECHTHEUM, ATHENS, FROM UIDE

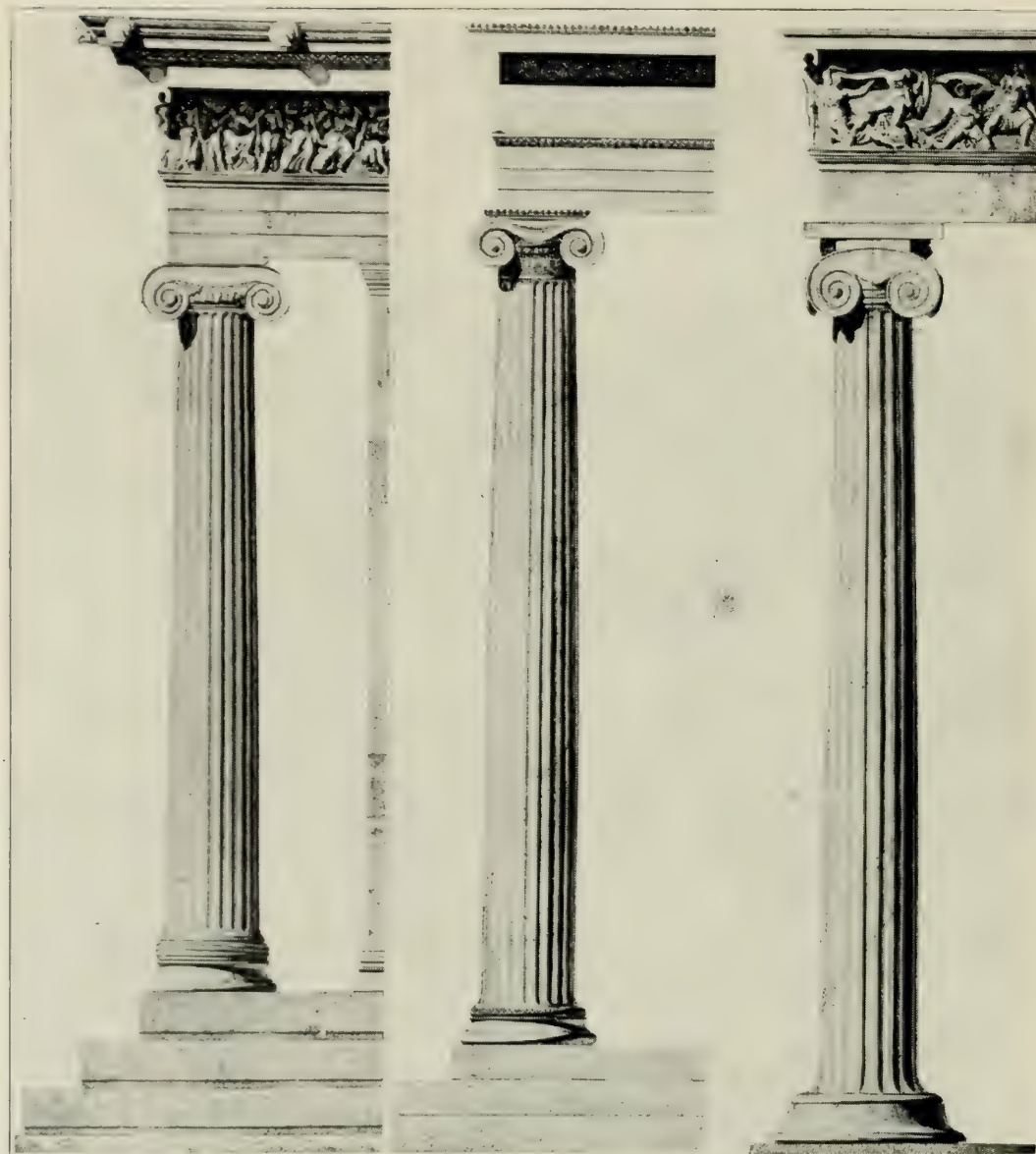


FIG. 24. COMPARATIVE STUDY OF IONIC CAPITALS, FROM UHDE

From left to right:

Column and Capital from Temple of Nike Apteros, Athens;  
Column and Capital from North Portico of Erechtheum, Athens;  
Column and Capital from Temple of Apollo Epikurios, Bassæ.



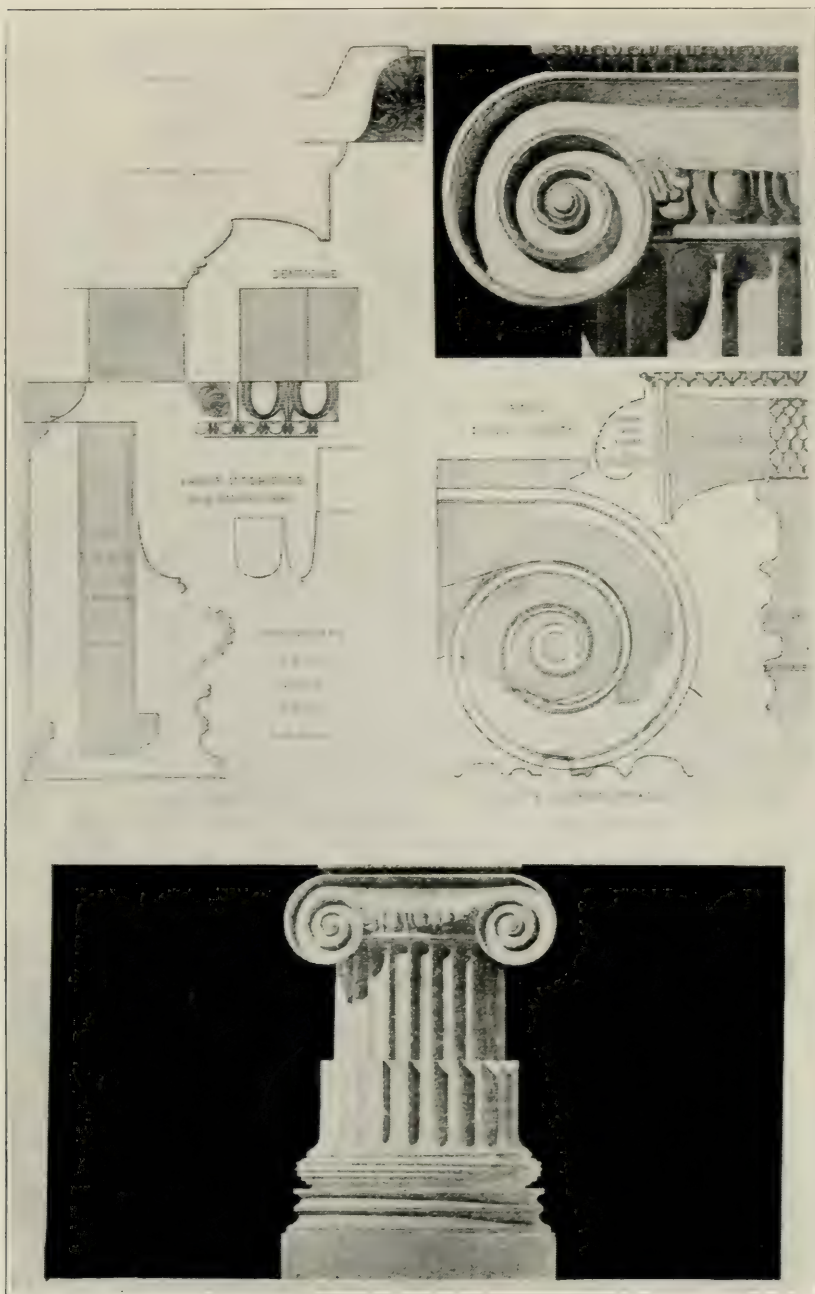


FIG. 25. IONIC CAPITAL AND DETAILS, MAUSOLEUM OF HALICARNASSOS,  
FROM D'ESPOUY



FIG. 23. IONIC CAPITAL, THEATRE OF MARCELLUS, FROM D'ESPOUY



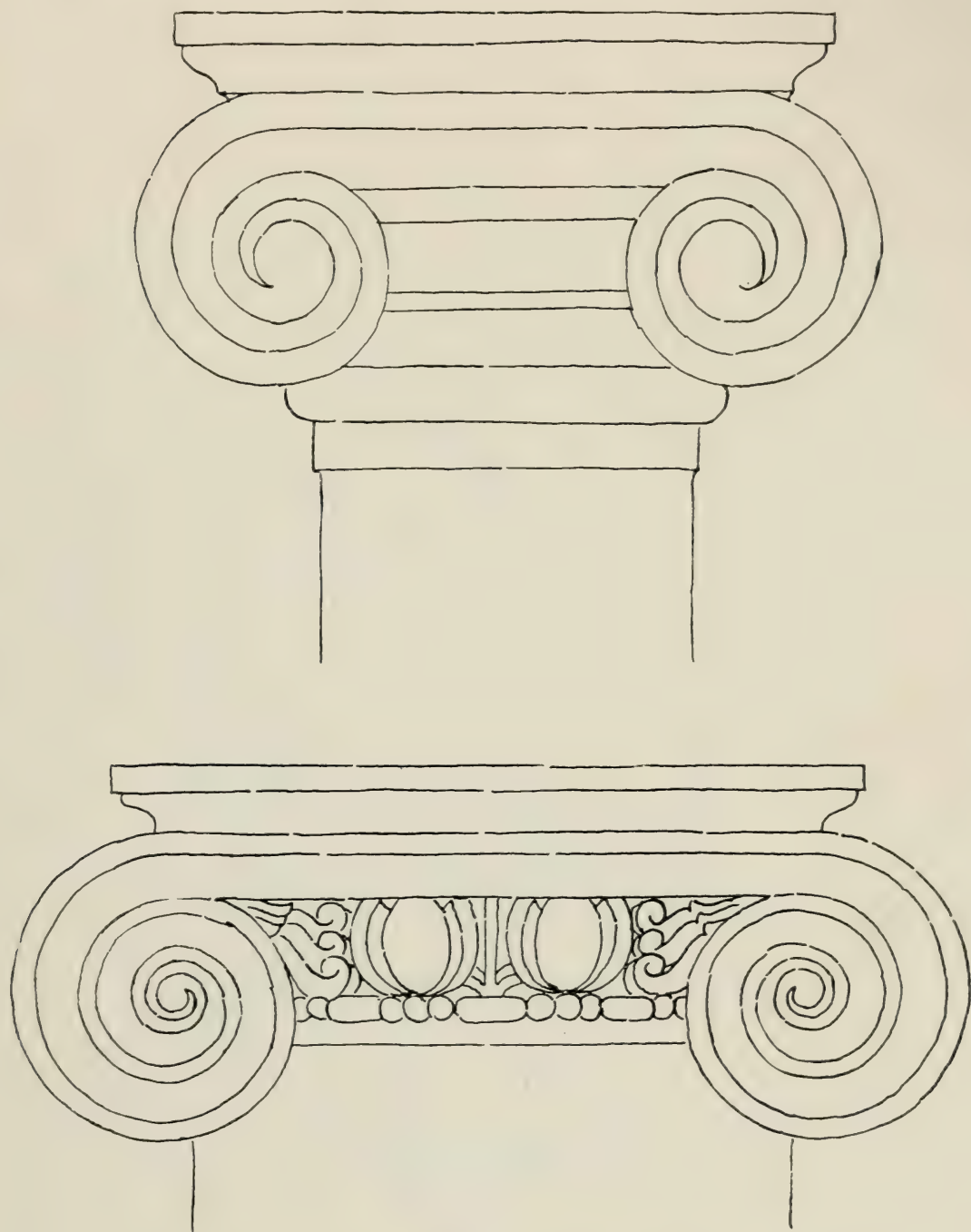


FIG. 27. IONIC CAPITALS, AFTER STEGMANN AND VON GEYMÜLLER

Above: Capital from the Canonica di San Biagio at Montepulciana.

Below: Capital from Church of S. Agostino—Monte Savino.

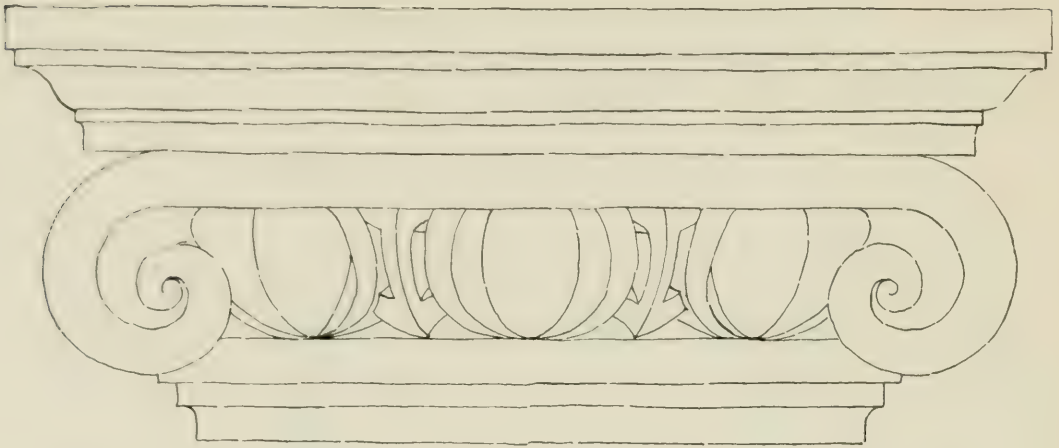


FIG. 28. IONIC CAPITAL FROM PALAZZO NOBILE AT MONTEPULCIANO,  
AFTER STEGMANN AND VON GEYMÜLLER



FIG. 29. CAPITAL FROM FLORENCE, AFTER STEGMANN AND VON GEYMÜLLER



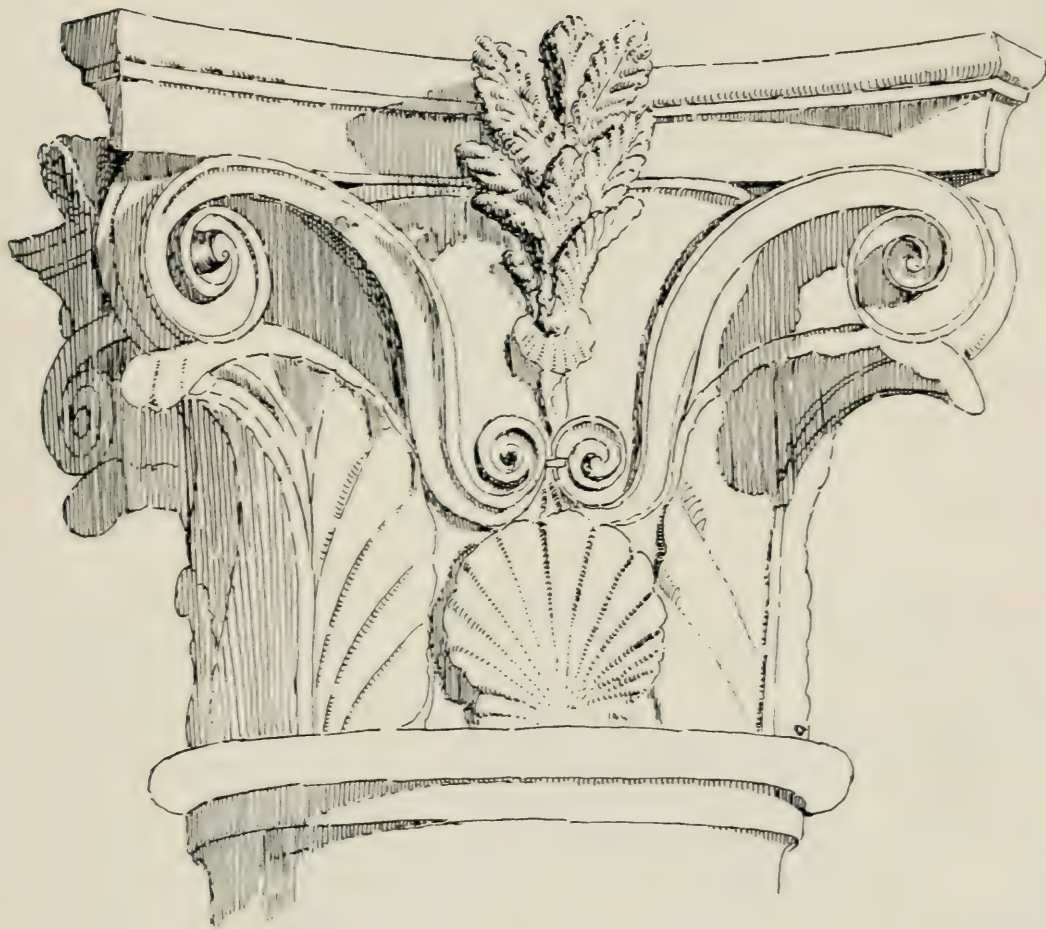


FIG. 30. CAPITAL FROM PALAZZO PICCOLOMINI, PIENZA,  
AFTER STEGMANN AND VON GEYMÜLLER



FIG. 31. EGYPTIAN BELL-SHAPED CAPITAL, AFTER STURGIS, WHO CREDITS PRISSE



FIG. 32. CAPITAL FROM THE SACRED ENCEINTE, EPIDAUROS, FROM D'ESPOUY





FIG. 33. CAPITAL FROM THE TEMPLE OF VESTA, ROME, FROM D'ESPOUY



FIG. 34. DETAILS OF VOLUTES FROM CAPITAL, TEMPLE OF VESTA, ROME,  
AFTER D'ESPOUY



FIG. 35. CAPITAL FROM TEMPLE OF MARS ULTOR, ROME, FROM D'ESPOUY



FIG. 36. CAPITAL FROM TEMPLE OF JUPITER STATOR, ROME, FROM D'ESPOUY





FIG. 37. DETAIL FROM CAPITAL, TEMPLE OF JUPITER STATOR, ROME,  
AFTER D'ESPOUY

## V. THE VOLUTE IN LATER CAPITALS

9. *Early Christian and Byzantine.*—While the use of the volute upon classic capitals has long been appreciated, its use upon the capitals of the Middle Ages has not been so generally remarked. In this connection it has seemed necessary to point out something of the trend of voluted forms in architecture between the time of the fall of the Roman Empire in the west and the culmination of the Gothic Period. This has been done principally because the volute has so long and frequently been considered simply a classic element, confined to classic periods or classic revivals. It is thought that by pointing out the continued and unbroken use of the volute in one form or another during the Middle Ages, this use, together with the well known popularity of voluted forms during the classic periods and the Renaissance, will serve to establish beyond a doubt the original contention and purpose in presenting the study, namely, that the volute is a universal element in nature, consequently in art, and that as such it persists and will continue to persist as long as man lives in his present environment. The tracing of voluted forms during the Middle Ages requires no very strong written argument and a pictorial presentation is perhaps as effective here as in the case of the classic examples.

Of the type of orders in use at Rome during the Empire only the voluted types, that is, the Ionic, Corinthian, and Composite, appear to have been used by the builders of the early Christian churches. Of the voluted forms, the Ionic was less used than its relatives, the Corinthian and the Composite. These two types were produced by thousands in every Roman province even as far away as Britain. This general class of capitals is called by the name Corinthianesque, for the Corinthian-like variety far surpassed the Composite in its frequency of use, and served as the prototype of the Gothic crocket capitals of a later period.

It has already been noted that capitals of the Corinthian, bell, or basket-type have been used with and without voluted decoration from the time of the Ptolemaic Period in Egypt to the present day, and from the early Christians, Byzantines, and subsequent church-





FIG. 38. CAPITAL FROM CHURCH OF PIERRE LE MOUTIER, NIÈVRE, FRANCE,  
AFTER MARCOU

building peoples the volute received its full measure of attention. With the second century, the artists sacrificed Roman types for freer versions, and from these early types it is possible to trace the complete transition to the foliated Gothic capital of the eleventh century. However, Roman forms persist in some localities even down to the eleventh century, a good example of a free version of a Roman variety occurring upon the church of St. Pierre-le-Moutier, at Nièvre, France (Fig. 38).

10. *Romanesque and Gothic*.—Forms more medieval in character, yet at the same time retaining the volutes, are shown in Fig. 39, a capital from the nave of the Cathedral of Toulouse, or Fig. 40, a capital from the nave of the church at Aignan, both of which retain the volute as an essential part of their make up. The Romanesque capital from the Cathedral of Bayeux (Fig. 41) represents a development midway between the Toulouse type and the example from St. Martin de Champs, Paris (Fig. 42). The volute in this latter type has become the Gothic crocket\* and persists not only in the capitals but also in the finials of the period. In this connection it should be noted that the crocket proper (circa 1192 B.C.) did not come into existence

\* Bond, "Gothic Architecture in England," p. 429.



FIG. 39. CAPITAL FROM THE NAVE, CATHEDRAL OF TOULOUSE, FRANCE,  
AFTER MARCOU

until after the so-called "crocket" capital, which was derived from the classic Corinthian type as indicated, and which gave rise to the "crocket" proper, but the term "crocket" capital is convenient, although historically incorrect.\*

From the Saint Martin de Champs capital it is but a step to the "wind-blown" Salisbury capital (Fig. 44), where the volute almost loses all resemblance to its early prototypes in the curly whorls of foliage. This type marks the culminating phase of the voluted capital during the Gothic period.

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\* For crocket see Fig. 43.



Another type of capital used in Byzantine, Romanesque, and Gothic art was the cubical block type, and even upon this capital, although there is no structural place for voluted forms, the volute often persists in the decoration, as will be noted in the Sancta Sophia capital (Fig. 45), the St. Peter's, Northampton, capital (Fig. 46), and the capital from the Musée d'Arles (Fig. 47), a Gothic version of the cubical block type.



FIG. 40. CAPITAL FROM THE NAVE OF THE CHURCH OF AIGNAN, FRANCE,  
AFTER MARCOU

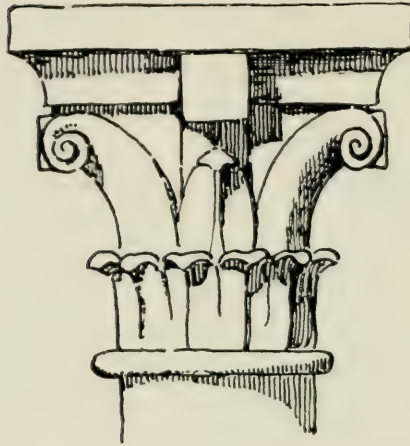


FIG. 41. CAPITAL FROM BAYEAUX CATHEDRAL, FRANCE,  
AFTER HAMLIN

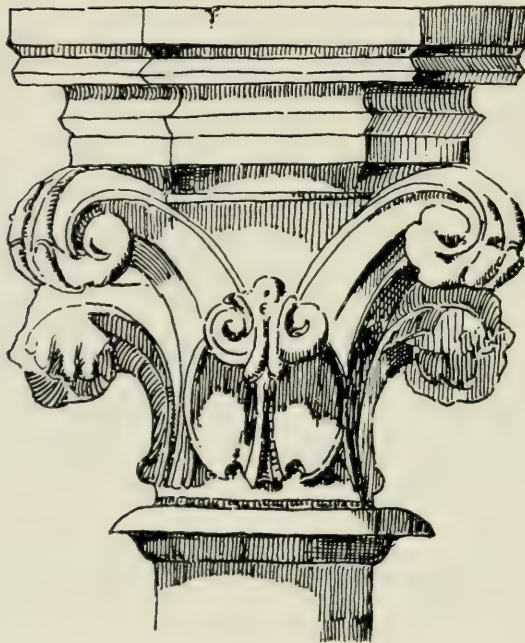


FIG. 42. CAPITAL FROM ST. MARTIN DE CHAMPS, PARIS, FRANCE,  
AFTER HAMLIN



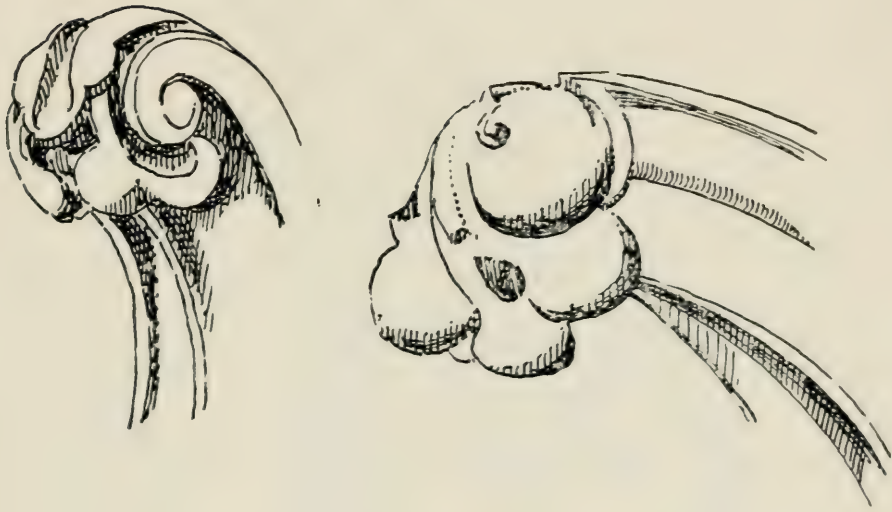


FIG. 43. FINIAL CROCKETS, A SKETCH

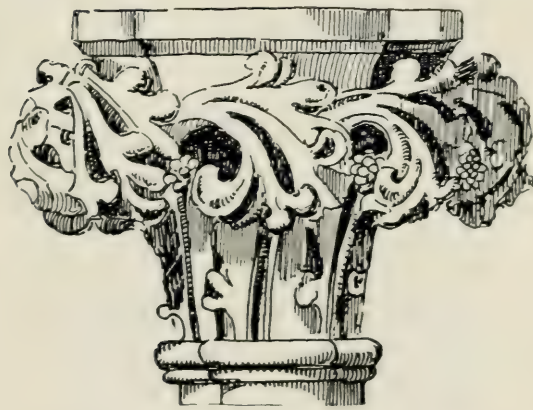


FIG 44. CAPITAL FROM SALISBURY CATHEDRAL, ENGLAND,  
AFTER HAMLIN

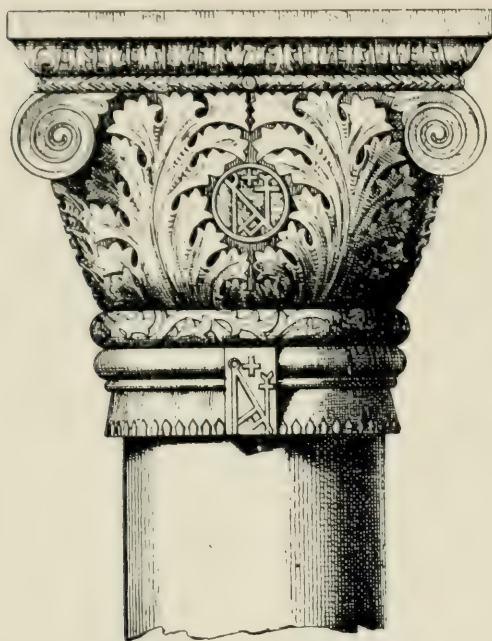


FIG. 45. BYZANTINE CAPITAL, SAINT SOPHIA, CONSTANTINOPLE,  
FROM PULGHER

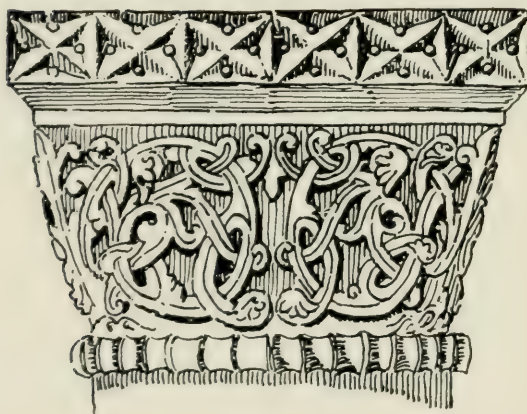


FIG. 46. CAPITAL FROM ST. PETER'S, NORTHAMPTON, ENGLAND,  
AFTER BOND





FIG. 47. CAPITAL FROM MUSÉE D'ARLES, AFTER MARCOU

## VI. THE VOLUTE IN OTHER STRUCTURAL FORMS

11. *Consoles, Modillions, and Brackets*.—Aside from these considerations of the use of the volute upon the capital, some attention should be paid to its use in other structural forms, where it has persisted with as marvelous an insistence as in the capital. Among these forms employing the volute as a motif may be mentioned consoles, modillions, and transitional brackets.

The employment of the volute as a motif for supporting members hinges upon its ability to make a graceful transition from the vertical to the horizontal, and vice versa. In this connection the spiral motif is usually a double one, employing two spirals winding in opposite directions, as will be noted in Fig. 53. A form thus composed serves as a bracket horizontally or vertically, and in this capacity has served its purpose from the time of the Erechtheum doorway down through the ages to modern times.

The voluted console form has likewise been employed as a keystone upon such structures as the Roman triumphal arches and the like. A similar bracket-like use is the employment of the form as modillions upon the entablatures of the Corinthian and Composite orders.

In addition to these well known uses in a structural manner, volutes have been employed to make transitions in line in situations where their structural significance becomes void. An example of this use occurs in the great scrolls employed in a buttress-like fashion, but for purely æsthetic purposes, upon the Church of Santa Maria della Salute at Venice. Upon other Renaissance buildings voluted inverted bracket forms have been used to make the transition, upon the façade, from the clerestory wall to the walls of the side aisles, well known examples of which use are to be found upon the various Jesuit churches in Italy.

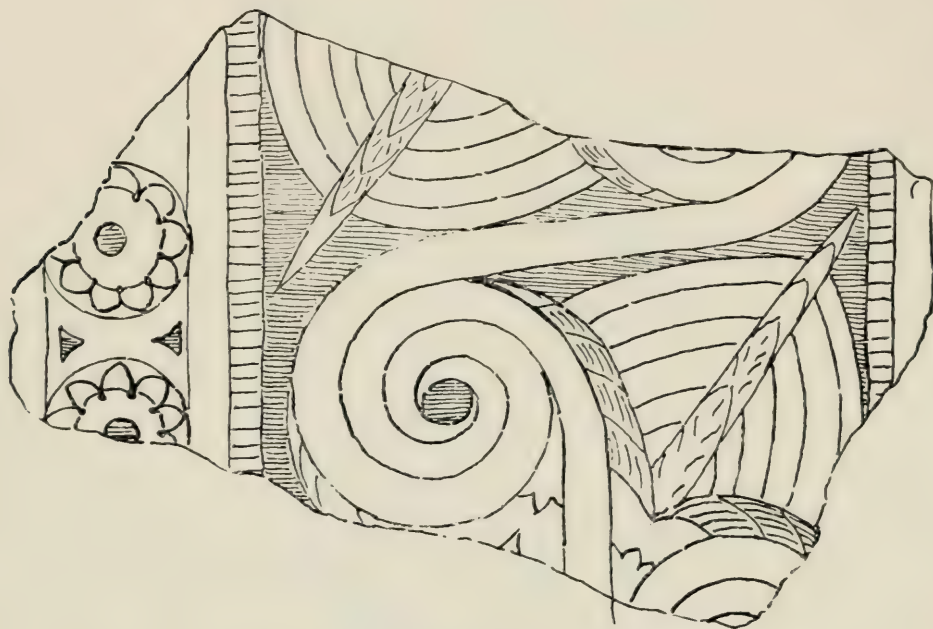


FIG. 48. SPIRALS ON FRAGMENT FROM PALACE AT TIRYNS,  
AFTER DÜRM



FIG. 49. ROMAN RINCEAU, A SKETCH



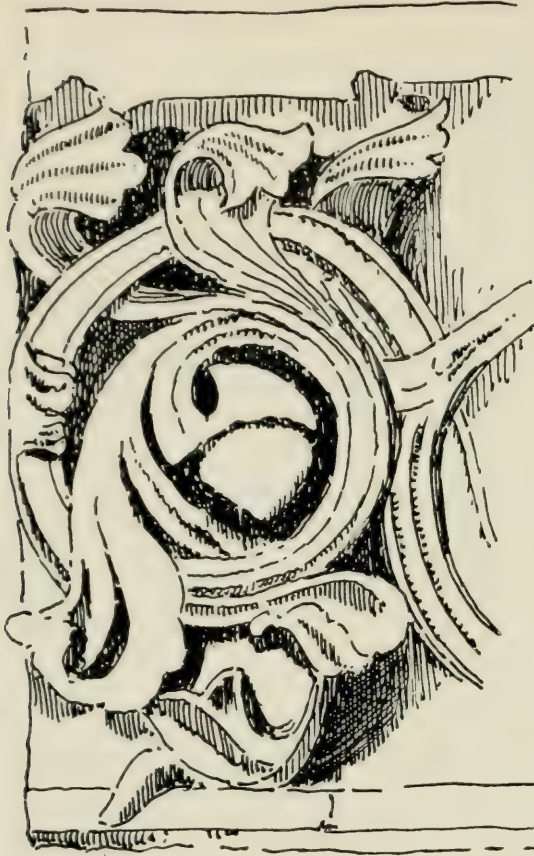


FIG. 50. GOTHIC SPIRAL CARVING, AFTER MARCOU

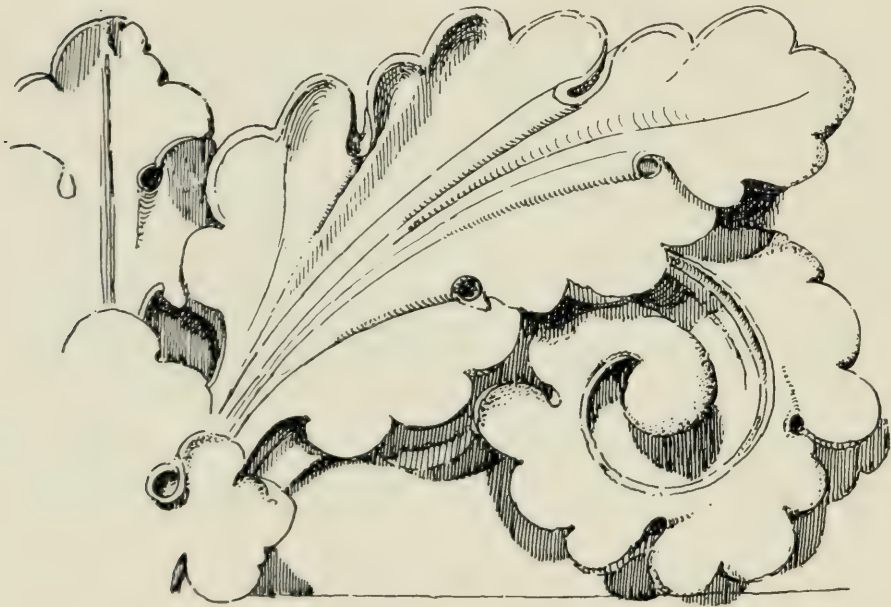


FIG. 51. SPIRAL CARVED DETAIL FROM CATHEDRAL OF PARIS, FRANCE,  
AFTER MARCOU

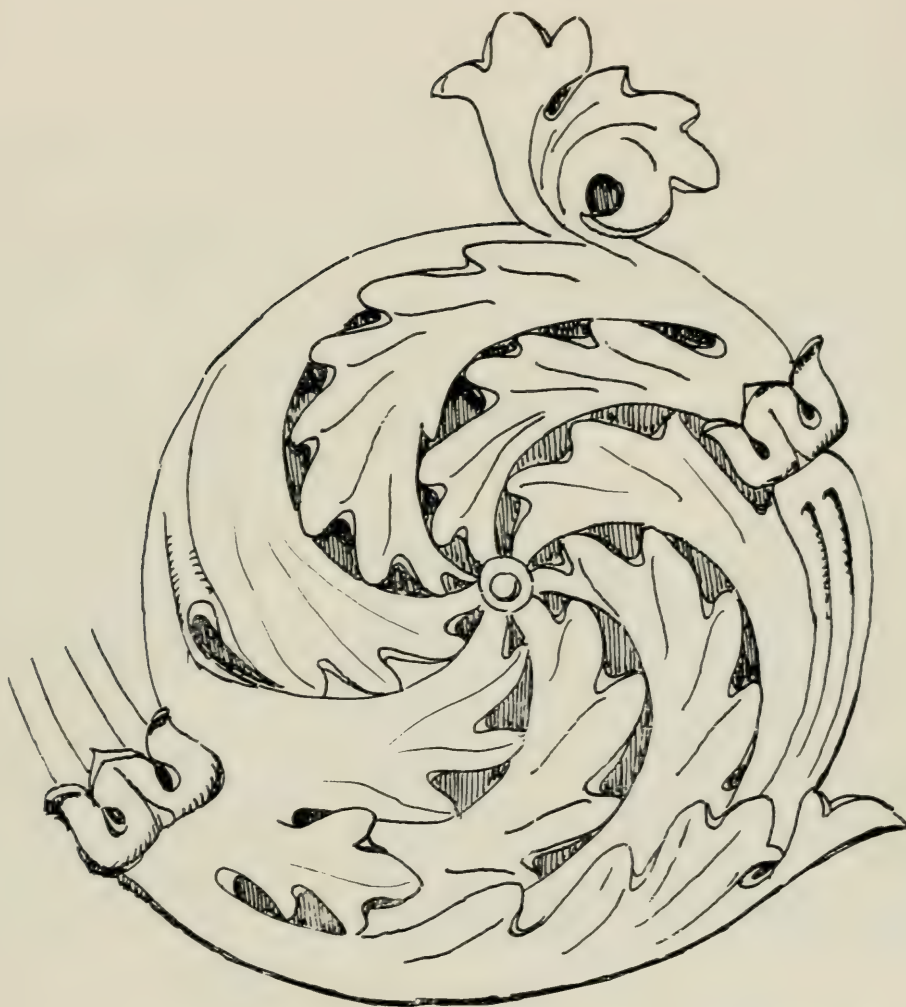


FIG. 52. SPIRAL CARVED BYZANTINE ORNAMENT, FROM CHURCH OF SAINT MARK, VENICE, AFTER DEHLI

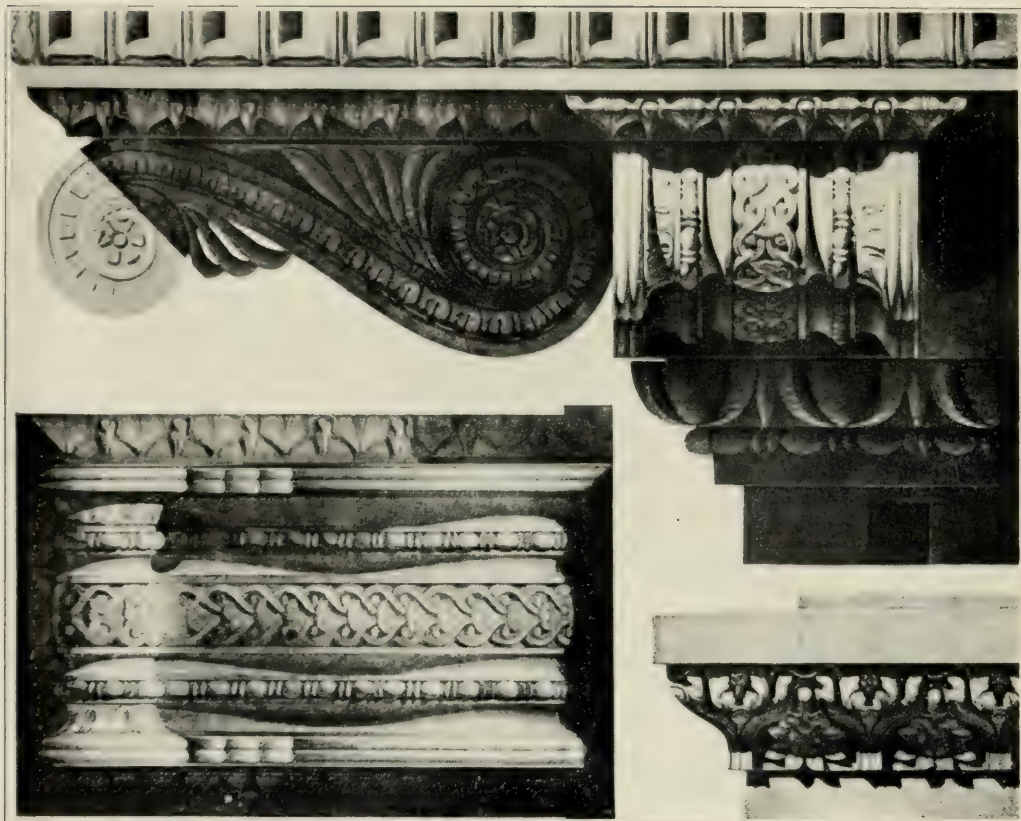


FIG. 53. MODILLION FROM TEMPLE OF CONCORD, ROME,  
FROM D'ESPOUY





FIG. 54. VARIOUS SPIRAL ORNAMENTS, SKETCHES FROM VARIOUS SOURCES

## VII. THE VOLUTE IN ARCHITECTURAL DECORATION

12. *Use from the Early Times to the Renaissance.*—The use of spiral decorative forms as architectural decoration in Egypt, Assyria, and early Greece, has already been mentioned. In its primitive use the spiral figured in decoration either as running ornament or as all-over decoration (see Fig. 48). These same motifs persisted in Greek architectural decoration of a later period, appearing in various forms and manifestations (see Fig. 54), and were subsequently handed down to Rome, where they were favorites, used especially as running ornament, but rarely in all-over patterns (See Figs. 10 and 49).

From Rome the spiral, as running ornament, found its way into the hands of the early Christians and Byzantines (Fig. 52), perpetuated itself during Romanesque times (Fig. 46), and culminated during the Gothic Period (Figs. 50 and 51). Its revival as running ornament or as a terminal motif during the Renaissance was a matter of course. It was accorded the same place as other classic forms.

## VIII. CONCLUSION

13. *Summary.*—The general conclusions to be drawn from the foregoing discussion may briefly be summarized as follows:

(1) The volute is one of the most universally occurring curves in nature; it represents a principle in nature, a fundamental law of growth. It is dynamic, infinite, and mysterious in its significance; and hence has from the earliest times had a great appeal to mankind, and has entered deeply into the art expression of all ages.

(2) The volute as an art motif has been developed from natural forms, rather than from a technomorphic inspiration. At the same time the curve as it occurs in art is not purely realistic or naturalistic; but is rather the natural curve idealized and conventionalized into an abstract, ideal form; even the very earliest spiral forms found in art are conventional, geometrical.

(3) Because of the universality of its appeal to the mind of man, the volute as an art motif has a wide geographical distribution, being found in all countries at all times under one guise or another. It appears to have developed independently, although not, perhaps, originated independently, in many cultural centers.

(4) From the evidence available it appears probable that there was little or no Assyrian influence in the development of the Ionic order, but that the spiral motif as found in Ionic art is a product of Ægean culture, and did not come from the East.

(5) The Ionic capital, if the general laws of architectural evolution are borne in mind, appears likely to have been developed from some primitive structural form; and the "log end" theory as formulated in the text offers the most plausible explanation of its origin. The evolution of the capital can be divided into four distinct steps:

- (a) Log ends with painted concentric circles as ornament.
- (b) Wooden bolster-block with painted concentric circles or tangent spirals as ornament.



- (c) Stone block capital with "scratched-in" spirals.
- (d) Stone capital with sculptured volutes and well defined echinus.

(6) The volute continues today a favorite motif in architecture and art partly because, so to speak, its use has acquired a momentum that would be difficult to overcome even if it were not still an inspiring natural form, but far more largely because of its intrinsic beauty and appeal. From classic times it has persisted down through the middle ages to the present day, its treatment and application constantly changing with the development of art and architecture, but its intrinsic form and significance remaining ever the same; and it will persist in the future so long as mankind continues to appreciate the truth and beauty of natural form, and to respond to the subtle appeal of the infinite.

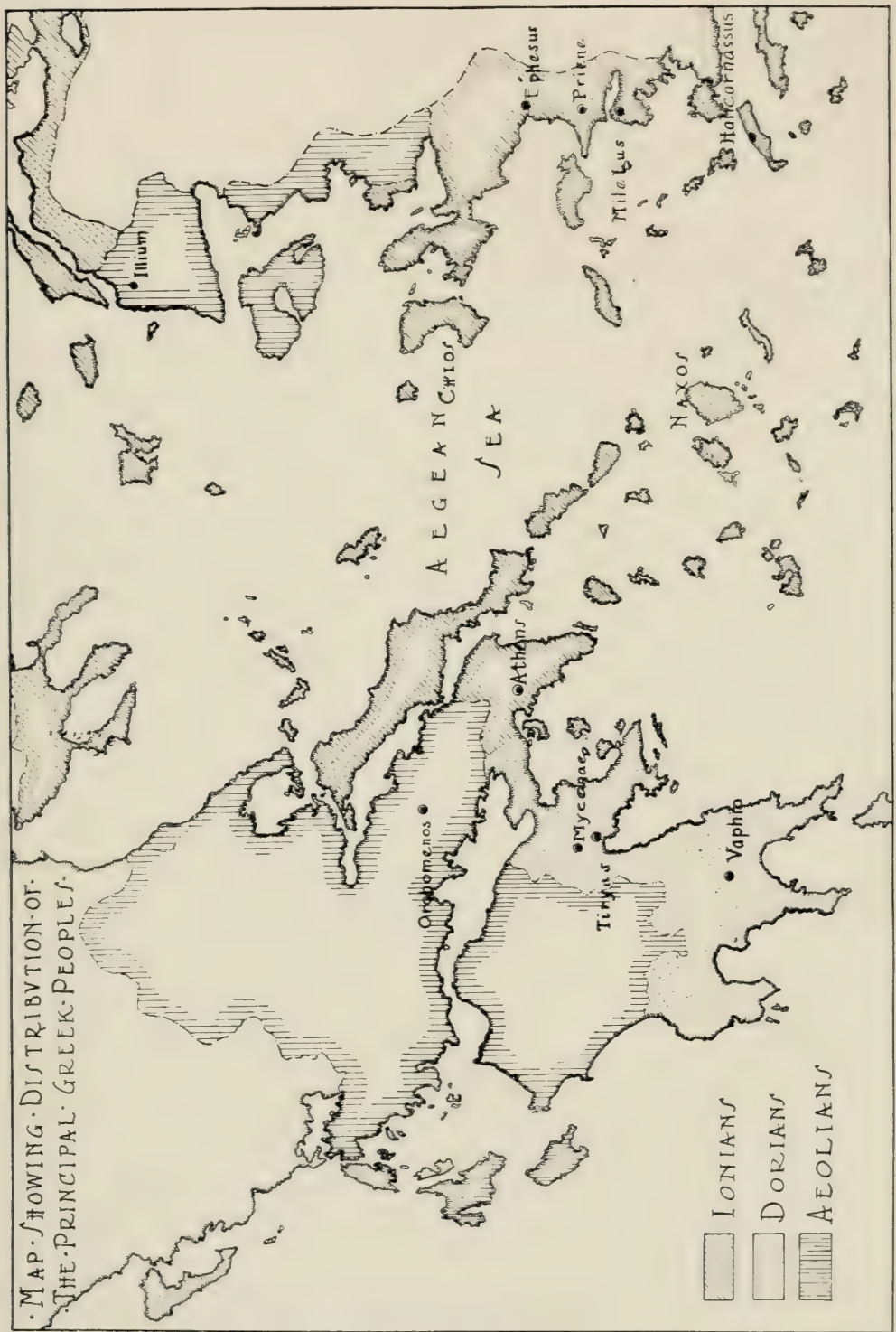


FIG. 55. MAP OF GREEK CONQUESTS AND MIGRATIONS, AFTER WEBSTER





## APPENDIX

## LIST OF IMPORTANT IONIC EXAMPLES

1. Archaic Capitals from Athens.
2. Archaic "Bolster" Capital from Delos.
3. Capital from Messa, Island of Lesbos.
4. Capital from Neandria in the Troad, Asia Minor, VII Century B.C.
5. Archaic Capitals from Delos.
6. Naxian Votive Column, Delphi.
7. Temple of Apollo, Naukratis, Egypt, 650 B.C.
8. Temple of Hera (Old), Samos, VI Century B.C.
9. Archaic Temple of Diana (Artemis), Ephesus, 560 B.C.
10. Temple upon the Illisus, Athens, 484 B.C.
11. Temple of Niké Apteros, Athens, 438 B.C.
12. Propylaea at Athens (Internal Order), 437-32 B.C.
13. Temple of Apollo Epicurius, Bassæ, 430 B.C.
14. Erechtheum, 420-393 B.C.
15. Various Lycian Tombs, V. and IV Centuries B.C.
16. Mausoleum of Halicarnassos, 354 B.C.
17. Temple of Dionysus, Teos, 350 B.C.
18. The Philipeion, Olympia, 338 B.C.
19. Temple of Apollo Didymæus, near Miletus, 335-320 B.C.
20. Temple of Diana (Artemis), Ephesus, 330 B.C.
21. Temple of Athena Polias, Priene, (near Miletus), 320 B.C.
22. The Cybele's Temple, Sardis, IV Century B.C.
23. Altar of Zeus, Pergamum, 197-159 B.C.
24. Temple of Fortuna Virilis, Rome, 100 B.C.
25. Theatre of Marcellus, Rome, 23-13 B.C.
26. Colosseum, Rome, 70 A.D.
27. Temple of Saturn, Rome, 285 A.D.

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